AMATEUR RADIO

VOL. 52, No. 11, NOVEMBER 1984

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

THREE COMPUTER PROGRAMMES TO ASSIST YOUR CW

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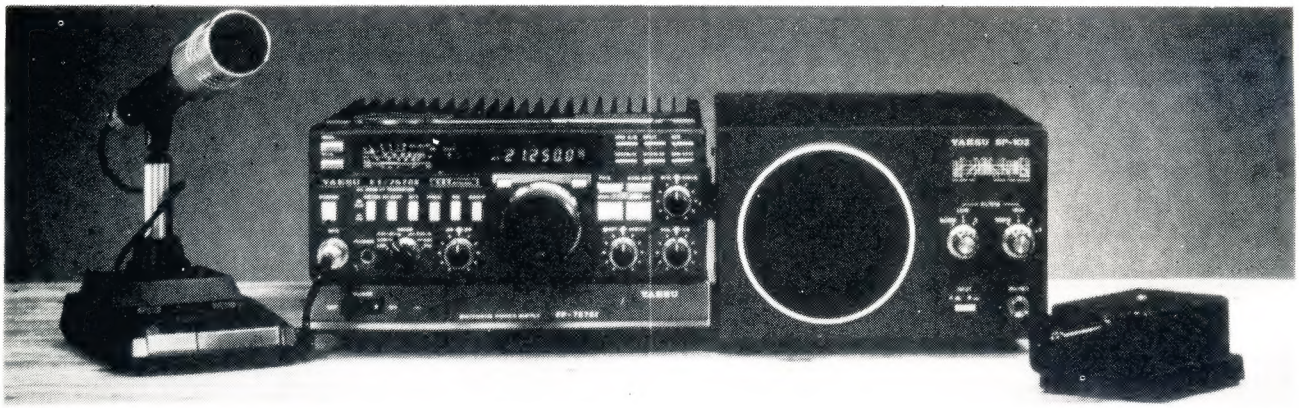

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Stan Roberts and Staff — VK3BSR

Photograph by Ken McLachlan VK3AH

Cover photograph. From L to R: Rear: John Brown VK3NYE, Scout Andrew Harding — 6th Nunawading South Group, Guide Raelene Browning — 2nd Blackburn South Guides, Arthur Gough — Branch Commissioner of Radio and Electronics, Bev Cuff — Victorian Guide Liaison for JOTA, Ranger Guide Carolyn Cuff — Laburnum and Nunawading Unit. Front: Guide Wendy Harding — 2nd Blackburn South Guides and Brownie Gabrielle Kirwin — 2nd Box Hill Brownies.

AMATEUR RADIO

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November is the month to "amateurly" get out and about. The Gold Coast Amateur Radio Society are holding their annual Hamfest on the 10th November and the Ballarat Amateur Radio Group 1984 Hamvention is on again over the weekend 10th, 11th November. All are welcome at both venues, so take the family along for a great time. Details on page 29.

Do you have a problem with CW and have access to a computer? Beginning on page 12 there are three separate programmes to assist with learning or improving CW techniques. The first programme is written by Ted Holmes VK3DEH for the TRS-80 Color computer but with minor alterations it will run on a Microbee. Bob Knight VK4KRK used a TRS-80 Extended Basic Color Computer to write a programme for upgrading from a K call to a full licence. The final programme is written by Geoff Hudson VK3CGH on a HP-87 is a programme which generates random five character groups.

Maurie O'Keefe VK3KO served in WWII as a wireless operator with the No 460 Squadron. Two years ago whilst visiting Canberra War Memorial Maurie noticed a Lancaster bomber, which was being restored, had no radio equipment. Maurie felt he would like to find radio equipment, restore it and then donate it to the Memorial as a tribute to his Squadron. Turn to page 19 for the full story of Maurie's "trials and tribulations" in restoring a T1154 and R1155 which he will present to the Memorial this month.

For the very technically minded page 10 will be of interest. High Frequency Wide Band Linear Amplifier Design written by Rex VK4BAT has plenty of mathematical calculations for constructing a 100W amplifier for 1.8 to 30 MHz.

DEADLINE

All copy for January 1985 AR must arrive at PO Box 300, Caulfield South 3162 at the latest by midday 13th November 1984. The necessity for the early deadline is due to Christmas Holidays with typesetters, printers, etc. If you desire something printed in January's magazine please ensure you adhere to this deadline.

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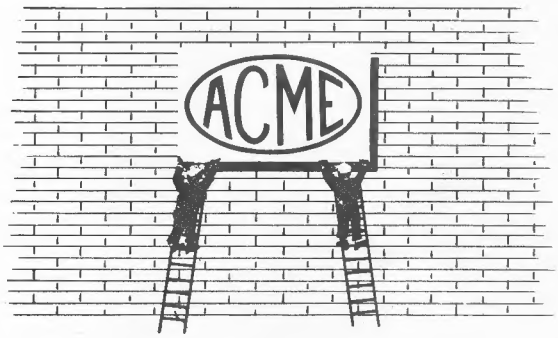

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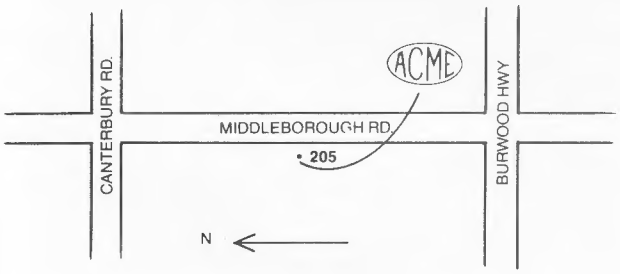

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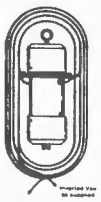

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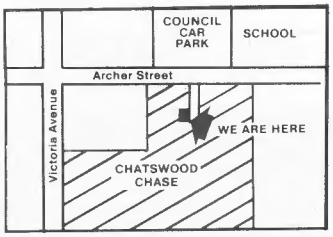

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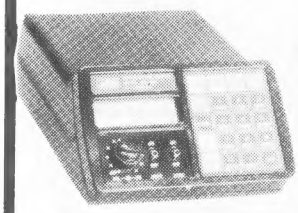

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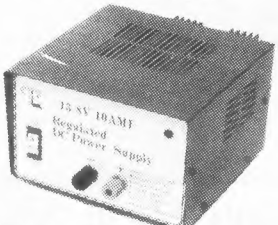

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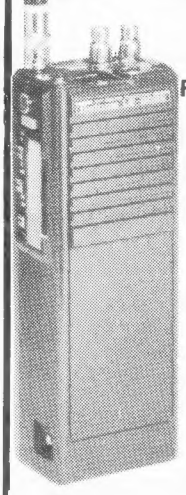

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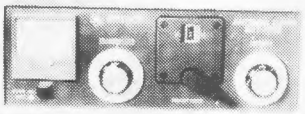

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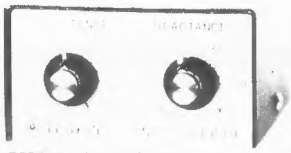

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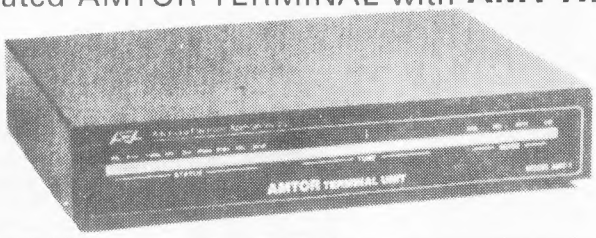

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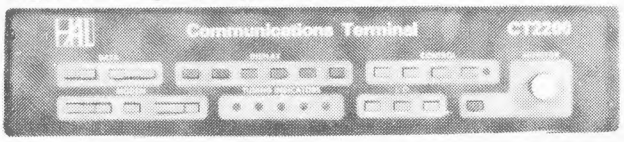

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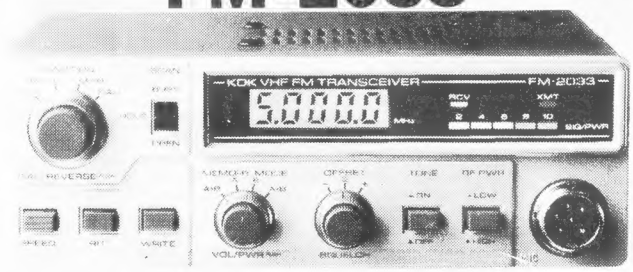

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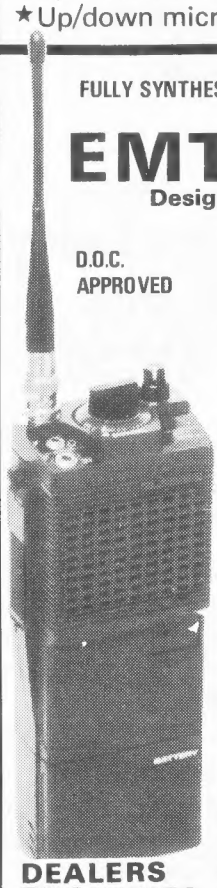

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* 40 channel UHF CB
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* Illuminated channel selection switch for night operation
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SPECIFICATIONS:

GENERAL
Freq. range 476.425-477.400 MHz UHF CB
Freq. control: Digital PLL synthesiser
Type of emission: 16F3
Antenna Impedance 50 ohms
Power supply: 8.4 v ± 15%
Operating temperature: -10 to + 60°C

TRANSMITTER
Output power: High 2.5W, low: 0.5W at 8.4V
Modulation: Variable reactance FM
Max. Deviation: ±5 KHz
Spurious Emission: More than 70 dB below carrier
Microphone: Built in electret condenser mic.
Op Mode: Simp Dup Ch. 1-10, ch 11 to 40 auto simp

RECEIVER
Receiving System: Double Conversion Supethet
IF Frequency: 1st: 21.6MHz, 2nd: 455 kHz
Sensitivity: More than 26dB S + N at 1 uF. Less than 0.5uV for 20dB noise quieting.
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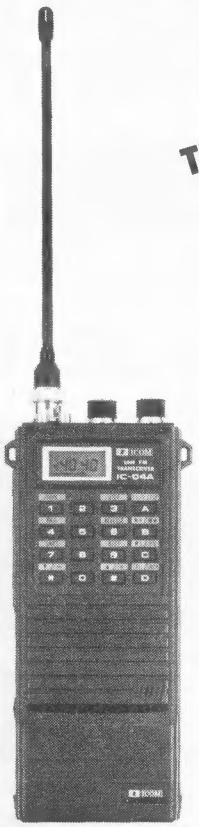

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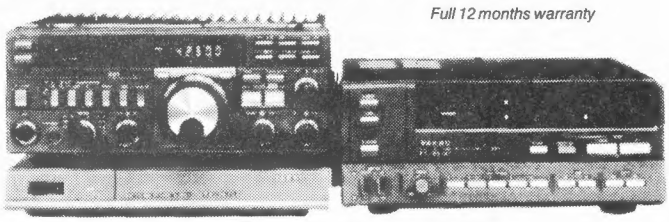

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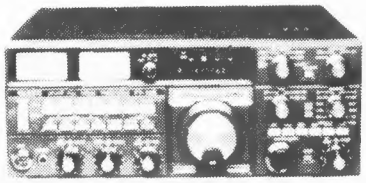

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a word from your EDITOR

FROM YOU TO THE PRINTER

Most people who send in items for publication in AR will be aware that the process seems to take a long time. In general the deadline for receipt of material by us is five weeks before the first of the publication month. Over the Christmas-New Year holiday period the deadline is earlier, and the magazine comes out later in February than the other eleven months. For technical articles at least another month's delay is normal.

The thought used to occur to me, before I became involved with the magazine, that if daily newspapers can have their material in print in a matter of hours why does the WIA Publications Committee need months? I imagine many of you have had similar thoughts. Maybe I can try to explain.

Of necessity the explanation will be brief, but sometime in our 75th Anniversary year we intend to write a full-scale article on the whole process. Perhaps the September, 1984 issue gave some inkling of the technology involved, but there is a great deal of pen and ink time necessary before we reach the high tech stage.

For a technical article there are at least eighteen steps from opening the envelope and realising "good, another tech article from Joe Blow," to the dispatch of the copies containing Joe's masterpiece in print. In sequence, these steps concern the Federal Office, the production team, the Editor, the Technical Editor, back to production, the drafting, typesetters, production, typesetters, production, printer, production, printer, bookbinder and mailing service!

Some steps take only a few minutes, but some, such as technical editing, can take a month, due to the handling procedure and the limits imposed on the editor's voluntary spare time. We have managed to reduce this interval recently, but if the author has left out some vital piece of information and a letter asking for it has to be written then delays really start to escalate!

Do you begin to realise? Believe me, when the full story is written I think you will be fascinated. Meanwhile, keep up the supply of articles and we will keep on trying to do them justice.

Bill Rice VK3ABP
Editor
AR

WIA NEWS

IMPORT DUTY

During the past months the Federal Office has been receiving many enquiries regarding personal import of amateur radio equipment. It is felt that there is now a need to restate the position to inform members of the procedures.

HISTORY

As members are aware during the middle of 1983 certain Australian manufacturers of radio equipment registered complaints with the Department of Trade and Industry regarding the modifications and use of amateur transmitters in non-amateur situations. This resulted in a 28 per cent duty being applied by the Customs Department across the board to all amateur transmitters. The Institute immediately took action and employed a professional customs agent to negotiate on its behalf. A meeting between the customs agent and the major importers of amateur equipment was arranged and a plan of action formulated. After lengthy negotiations with the Customs Department and the Department of Trade and Industry the only avenue available to remove the 28 per cent duty was for the Federal Body to accept the responsibility of approving equipment for import. After a great deal of soul searching and realising the difficulties that lay ahead it was finally agreed that the Federal Body of the Wireless Institute of Australia would accept the responsibility of deciding as to whether imported equipment needed minor or substantial modification to transmit outside the amateur bands.

This decision led to the promulgation of the by-law 85.15 by the Customs Department and the potential for removal of the 28 per cent duty.

ORGANISATION

In order to be able to carry out the responsibilities placed on it by the by-law, the Executive formed a Technical Committee to advise it of the suitability of equipment. The Executive gave this committee guidelines within which to evaluate equipment.

All importers known to the Institute were circularised with a package informing each of the requirements of the Technical Committee. This included such items as a sample of the equipment, full service manuals, users manuals, a statutory declaration that all equipment would be identical, copy invoice, copy weighbill and bill of lading, copy of certificate of origin and a cheque to cover the fee schedule. (The paperwork requirement was made as the Executive was aware that equipment bearing similar model numbers was available from a myriad of sources overseas and could be built to differing standards, a guarantee of confidentiality was given to each importer to cover business material.)

CONCLUSION.

If you have made it to the end of this article you should now have an appreciation of the Federal Body's Import Duty operations. At the Executive meeting held on 23rd August, 1984, the Executive passed a resolution that all importers including commercial and private individuals, be treated equally and there could at present be no free service for members. The Executive, in coming to this decision, realised that 'one off' personal imports by Institute members could be jeopardised, but it felt that its duty was to the majority of members who are now able to purchase transmitters without the 28 per cent duty being imposed.

It must be reiterated that these measures were taken as a stop gap measure until the new RadComms Bill and its Regulations are promulgated.

Reg Macey
Federal Secretary
AR

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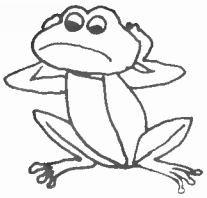
QSP



CHANNEL 0, SIX METRES, THE FACTS

The Minister for Communications, Michael Duffy has foreshadowed new additional TV stations, both commercial and ABC, being allocated channel 0.

In a news release dated 17th September 1984 Mr Duffy said: *"Channel 0 would be needed as an alternative VHF channel for those stations currently using channels 3, 4, and 5, which will be required to change channels to provide for FM radio development."*

He said: *"Channel 0 was subject to severe interference and because of this was considered a poor frequency for use in capital cities."*

But Mr Duffy then said: *"In regional areas, Channel 0 has some advantage over other channels in that it has the potential to cover larger areas."*

What does this mean? The Minister is saying that not only channels 3, 4, and 5 could switch to channel 0 — but others could also.

Already one rural TV station in Victoria, GLV8 Latrobe Valley, is eager to use channel 0 under the supplementary licence scheme.

Briefly, this scheme means existing rural TV stations can apply for another licence.

Applications have been received from thirty one TV stations and these are now being examined.

Mr Duffy said the number of applications was *"Excellent news for viewers"* and should lead in time to their having a wider choice of programming.

A DOC task force is examining options for VHF band allocations including channel 0, and the relocation of channels 3, 4, 5, and 5A.

The Minister has made a long-term commitment to relocate channel 5A stations because this frequency causes interference to a number of other services, including the Amatuer Radio Service.

The supplementary licence scheme also covers radio broadcasting with rural radio stations having applied for another licence.

The approval of stereo TV in Australia has also added a new dimension to spectrum usage.

Radio and TV services are going through an unprecedented growth period — with obvious pressures on the VHF TV and available FM broadcasting allocations.

Although adequate channels are available for TV requirements on the UHF band TV broadcasters are known to favour VHF over UHF for three reasons. 1) Not all homes have UHF sets. 2) They have to compete with other broadcasters, and using UHF could be a disadvantage against a competitor on a VHF channel. 3) UHF transmission equipment is dearer.

SIX METRES

The proposed increase in channel 0 stations and the deferred closure of SBS0 in Melbourne and Sydney until 6th January, 1986, is a blow to radio amateurs using six metres and the Wireless Institute of Australia.

In a letter to the WIA on 22nd July, 1983 DOC advised approval to use the segment 50-50.150MHz under strict conditions, these were covered in an insert, AR magazine August 1983.

A QSP in AR, September 1983 written by Bruce Bathols VK3UV, then WIA Federal President, said the part return of the lower part of six metres was the result of negotiations over five years for the return of the band 50-52MHz.

Peter Wolfenden VK3KAU, wrote the November 1983 Main QSP as Immediate Past President when he said: *"Let's ensure that we are not just re-visiting 50MHz, but are here to stay with the ultimate aim of recovering the remainder of the 50-52MHz allocation."*

Both Messrs Bathols and Wolfenden used the QSP to remind six metre operators that the Amateur Radio Service was the secondary service on 50-50.150MHz.

They stressed a responsible approach was needed so the primary service, broadcasting, was not interfered with by secondary station transmissions.

The outcome of a DOC review of 50-50.150MHz operations expected after the first twelve months is not yet known.

WHAT ELSE HAS THE MINISTER PUT ON RECORD RELEVANT TO THIS ISSUE?

NEWS RELEASE 12th March, 1984. *". . . as previously announced Multicultural Television transmissions on VHF channel 0 in Melbourne and Sydney would cease 31/12/84.*

"It was always intended that the channel 0 transmissions would be an interim step using less than optimum facilities to allow viewers to recieve Multicultural Television first on VHF and have time to learn about reception of UHF signals.

"It was important to note that because the VHF band was becoming congested any new developments in television broadcasting in major cities would be placed on the UHF band."

NEWS RELEASE 1st May, 1984. *"Most ABC and commercial television stations using VHF channels 3, 4, and 5 in Australia are to receive new frequency positions to make room for the introduction or extension of FM radio services.*

"Already a number of UHF services are in operation and from 1st January 1985 all existing and new Multicultural Television stations will broadcast on UHF only, as will many of the commercial television services licensed under the supplementary licence scheme."

OVERSEAS DEVELOPMENTS

Internationally those countries which have TV on Band 1, which is around the 50MHz region, recognise it's a poor frequency for TV due to electrical and propagation induced interference and were phasing it out.

Recently the United Kingdom authorities had given radio amateurs limited access to 50MHz.

AR

HIGH FREQUENCY WIDE BAND LINEAR AMPLIFIER DESIGN

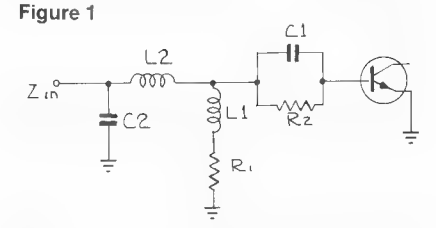
Rex Pearson, VK4BAT
34 Willara Street, Carseldine, Qld 4034

This paper will present the design information required to develop an HF wide band linear amplifier covering the frequency range 1.8 MHz to 30 MHz. Specific areas will be covered in a block format. The design information will then be used to construct a 100 watt amplifier covering the HF amateur bands. Full data will be presented on the amplifier along with component specifications.

The design steps to be followed are:
Gain compensating network and input matching
Input transformer and its compensation
Output transformer
DC feed circuit
Bias circuit
Design of an amplifier using the information presented
Conclusions

GAIN COMPENSATING NETWORK AND INPUT MATCHING

Figure 1



Referring to Fig 1 this style of network was chosen so that several objectives could be achieved,

a *compensation of the gain of the transistor over 4 octaves of bandwidth.*
b *provide a match between the input transformer and the transistor over 4 octaves of bandwidth.*

Looking at the circuit:

a *resistors R1 and R2 are used to dissipate the input power at the low frequency end of the spectrum; R2 is also used to raise the input impedance of the transistor at the LF end.*
b *L1 and C1 are used to bypass R1 and R2 at the HF end.*
c *L2 and C2 are to provide a broadband match at the HF end thereby reducing the HF mismatch to a low value.*

The method of deriving the formulae to calculate the component values is complex and will not be covered in this article. The formulae will be presented in a logical order so that step by step calculations can be made.

Several factors must be decided upon to use the design procedure effectively:

a *the loss of gain that can be tolerated at the HF end of the spectrum.*
b *the impedance required at the input of the network.*

In most practical situations a 3 dB loss can be accepted at the HF end.

The input impedance of the network will usually be chosen to allow easy matching. Once again in the practical case one of two choices will normally be taken, 2.75 ohms or 6 25 ohms. The reason for this is that when two transistors are combined the total impedance to be matched will be either 5.5 or 12.5 ohms. This allows the use of either a 4:1 or a 9:1 matching transformer to convert the impedance to 50 ohms.

It is also assumed the parameters of the transistor are known at each end of the frequency range.

$$R1 = \frac{Al.Ril\,Zo}{(Al.Ril) - (Al\,Ril.Zo) - Xil^2}$$

$$R2 = \sqrt{(Al.Ril.Zo) - Xil^2} - Ril$$

Previously it was stated that a reduction in gain of 3 dB could be tolerated at the HF end. The transistor data will show the gain at the HF and the LF end. Assume that the device has 18 dB at the HF end and 27 dB at the LF end, the 3 dB reduction allowed for at HF would mean that the gain would be 15 dB. The gain reduction necessary at the LF end will be 27 - 15 or 12 dB. This figure of 12 dB is the Al, or the gain reduction necessary at the low frequency end to maintain the same gain as the HF end (the terminology Al means attenuation, low end).

The other parameters are:

Ril input resistance at the LF end (series form)
Xil input reactance at the LF end (series form)
Zo = network input impedance (refer previous comments).

The next step is to derive the values for C1 and L1: This is an involved step and several constants must first be evaluated before continuing.

$$p = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

where: a (Ah.Rih.Zo - Rih² - Xih²) Rih
b 2.Rih.Xih.R2
c a- (2.Rih² + Rin.R2)R2
Ah HF gain reduction
Rih and Xih are the input impedance at HF

$$\alpha = \frac{R2}{Rih\,(p2 + 1)}$$

where p is given above

The value of C1 can now be calculated:

$$C1 = \frac{\sqrt{\frac{R2}{Rih} - 1}}{2\pi Fh.R2}$$

Fh = freq in hertz

$$L1 = \frac{R1\sqrt{\frac{R1.p}{R1} - 1}}{2\pi Fh}$$

$$R1.\ parallel = \frac{Ah}{Ah - (1 + \alpha)}\,Zo$$

The value of C2 and L2 may now be calculated. The combination of the transistor input impedance and R1, R2, C1 and L1 will now be transformed into an equivalent series circuit. Refer to the series of figures in figure 2:

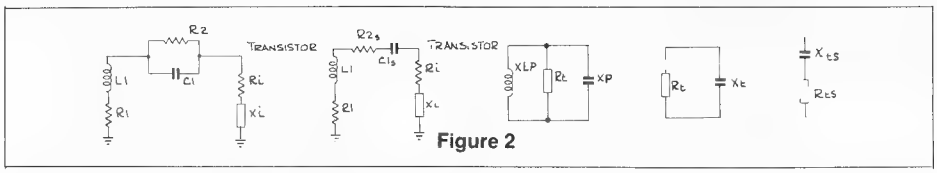


Figure 2

The first step is to transform the parallel branch of C1 and R2 to an equivalent series circuit.

R2 series = α Ri

XC1 s = - R2 series $\sqrt{\frac{R2}{R2s} - 1}$

The total impedance in this branch is:

R = R2s + Ri
X = XC1s + Xi

This branch is now transformed into an equivalent parallel circuit.

$$Rp = R\left(1 + \left(\frac{X}{R}\right)^2\right)$$

$$Rp = X\left(1 + \left(\frac{R}{X}\right)^2\right)$$

P = parallel

The same is now done for the branch R1 - XL1:

R1p calculated above

$$XL1p = \frac{R1p}{\sqrt{\frac{R1p}{R1} - 1}}$$

These parallel components are now transformed into a total parallel equivalent circuit:

$$Rt = \frac{Rp.R1p}{Rp + R1p}$$

$$Xt = \frac{Xp.XL1p}{Xp + XL1p}$$

The impedance is now transformed into an equivalent series circuit:

$$Rts = \frac{Rt}{1 + \left(\frac{Rt}{Xt}\right)^2}$$

$$Xts = \frac{Xt}{1 + \left(\frac{Xt}{Rt}\right)^2}$$

Again using the transformation formulae

$$L2 = \frac{Rts\sqrt{\frac{Zo}{Rts} - 1} - Xts}{2\pi Fh}$$

$$C2 = \frac{\sqrt{\frac{Zo}{Rts} - 1}}{2\pi Fh\,Zo}$$

This now completes the design of the basic network, parasitic elements can now be taken into account if a greater degree of accuracy is desired. For general amateur purposes these can be ignored, also most people would not have the test equipment required to perform the relevant measurements, and the general component tolerances would be greater than the inaccuracy caused.

DESIGN OF THE INPUT TRANSFORMER

There are various types of transformer that can be used for this application, the two most common types being:

a *conventional type with primary and secondary winding*
b *transmission line type*

For reasons of simplicity a conventional type will be used in this design procedure.

There are several factors that must be considered when designing the transformer. These are:

a power handling capacity
b primary reactance
c turns ratio
d compensation

POWER HANDLING

To save going into all the calculations involved in the design of the transformer several short cuts have been taken. It has been assumed that the core material is the PHILIPS type 4C6, this has a Ue of 120 and is suitable for HF use. In this material there are several core sizes, the maximum power that can be handled by these cores has been calculated, it was assumed in the calculations that the maximum loss in the core would be no more than 1%. This will mean that there will not be undue core heating.

SIZE (OD)	POWER
36 mm	300 W
23 mm	60 W
14 mm	15 W
9 mm	3 W

PRIMARY REACTANCE

The ferrite core has very little effect on the performance of the transformer at the HF end of the spectrum, but as the frequency is lowered the core has an increasing effect on the reactance of the transformer. Usually a compromise has to be reached between core material and turns required for a HF transformer. This compromise once again can be met by using 4C6 material.

As a general rule the primary reactance should be approximately four times the impedance of the circuit to which it is connected, this can be calculated by

$$Luh = \frac{4R}{2 \quad F}$$

where l uH
F freq in MHz

eg for 1.8 MHz the figure is 17.7 uH

To calculate the turns required to achieve an inductance of 17.7 uH another formulae is used:

$$n = \sqrt{\frac{L.l}{Uo\ Ur\ A}}$$

where L inductance in uH
Uo $4\pi 10^{-7}$
Ur = relative permeability of the ferrite. 4C6 : 120
A = cross section of core
n = number of turns
l = av length of lines of force

Below is a table giving A and l for various toroids useful for HF use.

TOROID SIZE	A	l
36 mm	92.5×10^{-6}	9.2×10^{-2}
23 mm	31.5×10^{-6}	5.7×10^{-2}
14 mm	12.5×10^{-6}	3.5×10^{-2}

This completes the primary winding of the transformer.

TURNS RATIO

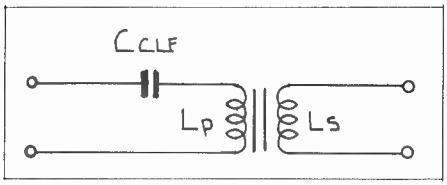
To calculate the secondary turns of the transformer the familiar formulae is used:

$$\frac{Np}{Ns} = \sqrt{\frac{Zp}{Zs}}$$

eg if the impedance ratio required is 50 ohms to 12.5 ohms the turns ratio is 2:1

LOW FREQUENCY COMPENSATION

The purpose of low frequency compensation is to ensure that the transformer remains resistive at the LF end.



$$Cclf = \frac{Lprimary \times 10^{6}}{R^2}$$

where L = uH
R = primary impedance (50 ohms normal)
C = nF

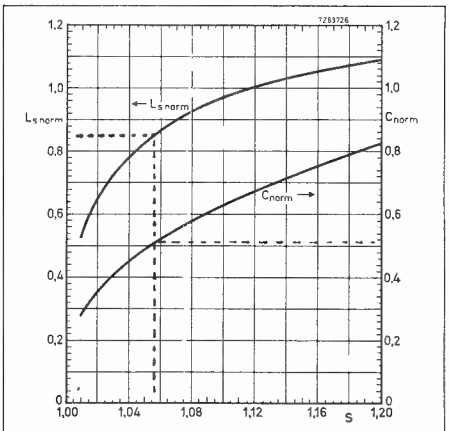
HIGH FREQUENCY COMPENSATION

The purpose of HF compensation is to cancel the effects of the stray inductance of the transformer at the HF end of the spectrum.

The first step is to measure the stray inductance of the transformer. This is done by placing a short circuit on the secondary of the transformer then measuring the inductance presented by the primary, this is the stray inductance. A set of graphs have been designed to enable rapid calculation of the values needed for the compensation capacitors. The stray inductance is first normalised for use with the graph by the formulae:

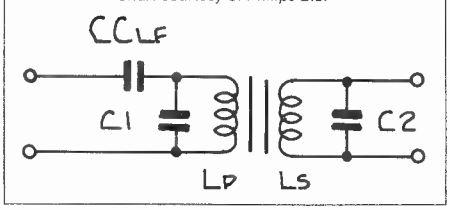
$$Lnorm = \frac{W\ max \times Lstray}{Rprim}$$

where W max = 2πFmax
Ls = uH
Rp = prim R in ohms



Graph 1

Chart courtesy of Philips Ltd.



With the aid of the graph shown above:

a max input VSWR can be calculated
b Cnorm can be calculated

Refer to the dotted lines on the graph these show how it is used. The capacitor C1 can now be calculated:

$$C1 = \frac{Cnorm \times 10^{6}}{W\ max \times Rp}\ pf$$

where Wmax is 2πF max (MHz)
Rp is the primary R in ohms

C2 = Z x C1

where Z is the impedance ratio of the transformer

This now completes the design of the input transformer, some of this information will be used in the design of the output transformer. The capacitor C1 would normally be a variable type to allow for an adjustment for minimum VSWR at the upper frequency limit.

THE OUTPUT TRANSFORMER

For reasons of simplicity and ease of manufacture a transmission line style of transformer will be used for the output. The advantage of this type is the very high co-efficient of coupling between primary and secondary at the HF end. The primary of the transformer usually consists of either brass tubes or copper braid loaded by ferrite tubes to increase the inductance at the LF end. The inductance required at the LF end is expressed by:

$$L = \frac{R}{2\pi F\ min}$$

where R is the C to C impedance
F is the minimum freq in MHz
L is in uH

The next step is to calculate the C to C impedance required for the power level concerned:

$$R = \frac{2\ (Vcc - Vsat)^2}{Pout}$$

Vsat for an 80 watt transistor at 13 volts is typically 2 volts

Due to the style of transformer chosen only fixed transformation ratios are possible ie $a:b^2$.

The type of ferrite material required for the transformer can now be chosen. In the practical case any material that does not have high losses at HF and one that has a Ue of greater than 250 can be used. Two types have been tried and gave good success, these were Philips 4B1 tubes and Neosid F14 toroids. LF compensation can normally be ignored, so can HF compensation on the secondary side.

Compensation for the primary side is usually necessary and can be calculated from the data already given for the input transformer. In the practical case the figure chosen will usually require the fiddle factor to be applied ie values above and below the calculated should be tried looking for the best compromise between efficiency and frequency for max power output.

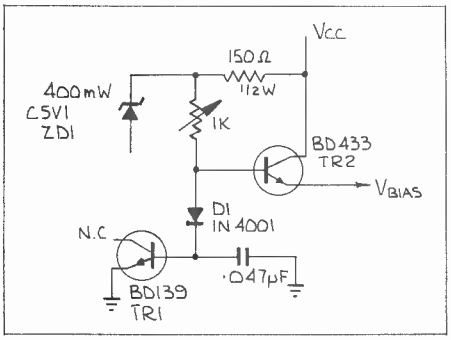
THE COLLECTOR CHOKE

The collector choke has two main purposes in the design of the amplifier.

a to supply the DC to the amplifier
b to ensure that there is a 180 degree shift between the two collectors thereby giving greater second harmonic suppression and slightly improving the IMD.

A practical choke would consist of 6 bifilar turns spaced evenly around a 14 mm 3H1 toroid, this will be suitable for amplifiers up to 300 watts PEP.

THE BIAS CIRCUIT



General considerations: the average HF power transistor has a Hfe of between 20 and 50. For the design of this bias circuit the min Hfe will be used, thus allowing for a margin of safety. For the case of a 100 watts PEP amplifier the typical collector current for a 12 V supply will be about 15 amps. This means that the base current will be in the order of 750 mA. The bias circuit has to be able to supply this current. The circuit also has to be able to compensate for increases in Iq as the temperature of the power transistors rises. The BD139, TR1 is used for this purpose. TR1 is normally mounted between the two transistors (PA) and as the PA temperature rises the Vbe of TR1 decreases at the rate of -2mV/°C. This reduction of the bias voltage will thus maintain thermal conditions around the circuit. The pass transistor has been chosen for its high Hfe and large dissipation.

HEATSINK REQUIREMENT

Special care should be taken when selecting the heatsink. Under normal conditions the power dissipated in the heatsink is equal to Pin - Pout. These factors can be easily determined. Where the problem starts is when a mismatch is presented to the amplifier, under these conditions the power dissipated

can be extremely high and if the heatsink cannot keep the junction temperature to a safe limit . . . bye bye transistor. As these are usually relatively expensive devices it can be a lot less costly if a larger heatsink than is necessary is used in the first place.

THE PRACTICAL AMPLIFIER

The circuit shown above is the realisation of the previous pages of theory. After the initial design was completed there were several changes necessary to achieve the performance desired. These will be listed and their effects will be stated.

At initial switch on, the power out at LF was 60 watts and at HF it was 80 watts. The input VSWR was checked and was 1.5:1 at the LF end and was 2.5:1 at the HF end. C2 was adjusted at 28 MHz and this achieved a reduction to 1.8:1. The value of C3 was increased slightly (100 pF) and C2 was readjusted, this achieved an input VSWR of 1.5:1 at the top end. The value of L1 and L2 was increased from a half turn to 1 turn and C2 was readjusted. This achieved better than 1.35:1 between 20 and 30 MHz. This was deemed to be good enough. This reduction in input VSWR caused an increase in output power from 80 watts to 95 watts. The next step was to adjust the compensation of the output stage. The calculated value was 1200pF, this had to be increased to 1600 pF. The ratio between C11, C12 and C17 has to be found experimentally. In several designs the ratio of C11 = C12 = 1/6 C17 has found to be fairly close. The output power had now increased to 110 watts at 28 MHz. When determining the values for these capacitors a compromise between power out and efficiency has to be reached. Next the lack of power at the low frequency had to be tackled. The collector current at the LF end was well below that of the HF end indicating that R2 and R3 were dissipating too much power. Their value was increased and the power out increased to 120 watts, there was no effect on the input VSWR. The performance goals had now been met. These are plotted below.

Several points should be noted when selecting the components. Several of these have to carry very large current eg C11, C12 and C17 these are best comprised of several capacitors in parallel and if possible high voltage types. Silver mica are ideal for this application but these are not readily obtainable. The amplifiers that I have constructed have used the Philips 424-427 poly capacitors in parallel for C17 and the 628 ceramics for C11 and C12. C3, C4 and C5 used 425 series and the rest of the capacitors consisted of the 342 or 352 series. R2 and R3 can be grounded if required but by bypassing these approx 150 mA of bias current can be saved, this lets the regulator work a little easier. C4 and C5 can also be grounded at their junction, but by holding this slightly above ground it enables a better balance of drive to the PA transistors, hence more even collector currents.

A full parts list is given at the end of this article along with transformer details.

CAPACITORS

C1	=	8.2 nF 500 V
C2	=	60 *pF* 808 series trimmer in parallel with 100 *pF* 638 series ceramic
C3	=	560 *pF* poly — series 425
C4, C5	=	820 *pF* poly — series 425
C6, C7	=	100 nF — series 342
C8, C9	=	3 x 1 nF — series 342
C10	=	100 nF — series 342
C11, C12	=	2 x 100 *pF* — series 638
C13, C14, C15, C16	=	100 nF — series 342
C17		3 x 390 *pF* — series 425

RESISTORS

R1	=	5.6 ohms ¼ watt
R2, R3	=	10 ohms 1 watt
R4 R5	=	10 ohms ¼ watt
R6, R7	=	10 ohms ¼ watt

INDUCTORS

L1, L2, L3, L4	=	1½ turns ¼ inch ID
L5, L6		several ferrite beads slipped over a piece of tinned copper wire

TRANSFORMERS

T1	=	4C6 ferrite of 14 mm size. Primary consists of twenty one turns of 24SWG wound fully around the core. Secondary is seven turns of 20SWG wound evenly around the core
T2	=	3H1 ferrite of 14 mm size. Winding consists of six bifilar turns spaced evenly around the core. Wire size 16 to 18SWG
T3	=	3B1 ferrite tubes approx 27mm long. Primary consists of one turn of copper braid. Secondary consists of four turns of 20SWG wire (two wires twisted together)

TRANSISTORS

Tr1, Tr2	=	Philips DX542CF (80 watt, 30 MHz, 13 dB gain)

AR

THREE WAYS TO LEARN (OR IMPROVE) YOUR CW

Peter Gamble, VK3YRP
Technical Editor

Personal Computers are making their presence felt in the amateur shack in a variety of ways — log-keeping, antenna calculations, satellite predictions, RTTY etc. Here are some ideas for another use — learning (or improving) your CW!

Three programmes are reproduced here, each with different techniques and features. You can either copy one, or use an amalgamation of ideas to suit your own requirements.

The first one is from Ted Holmes VK3DEH, and was written for the TRS-80 Color Computer. Ted claims that "very little needs to be changed to make it work on just about any machine", and I had no difficulty in getting it going on my Microbee. The programme sends 10 groups of 5 random characters at the speed you choose and then displays them on the screen. The characters are specifically oriented from the simple one and two element characters to the more complex five and six element punctuation marks.

Bob Knight VK4KRK, who uses a TRS-80 Extended Basic Color Computer, wrote the second programme as an aid in upgrading from a 'K' call to a full call, so that he did not need to be present at appointed times for CW practice.

The programme provides a range of facilities, including:

- *choice of two speeds, 6 or 12 words per minute,*
- *punctuation marks and combination characters are included,*
- *a message of up to 249 characters can be stored for subsequent replay.*

The programme first sounds the character and then displays it in large format, high resolution graphics. Bob writes:

"With regard to the programme, some explanation of the format may be in order. Its cumbersome appearance is a result of keeping 'GOSUBS' and their attendant delays to a bare minimum. Learning Morse with a built in recognition delay is definitely out. I cheated in formatting the gaps between dits and dahs. During these gaps the computer actually sounds the highest frequency it can produce.

Operation of the programme is simple. Press any letter, number or punctuation mark (full stop, comma or question mark) to hear and see it. Press 'UP ARROW'

● **Cont. on Page 14**

PROGRAMME 1:

by Ted Holmes VK3DEH

```
10 CLS:DIM C$(100)
15 SOUND 240,4:SOUND 200,4
20 PRINT@39,"color code practice"
30 PRINT PRINT" WHAT SPEED DO YOU WANT: INPUT"
40 INPUT"(1 - 5)THEN PRESS(ENTER)",H:SOUND 140,2:SOUND200,2
50 IF H<4THEN I=1 ELSE I=2
60 PRINT "WHAT DEGREE OF DIFFICULTY.INPUT"
70 INPUT"( 1 TO 20)THEN(ENTER)";H
80 CLS:PRINT@169,"MESSAGE BEGINS"
90 FOR Z=1 TO 10
100 FOR T=1 TO 460/(H*H):NEXT T
110 FOR J=1 TO 5
120 FOR T=1 TO 460/(H*H):NEXT T
130 B=RND(K*2)
140 E:E+1
150 FOR C=1 TO B
160 READ A$:NEXT C
170 FOR S=1 TO LEN(A$)-1
180 A=VAL(MID$(A$,S,1))
190 SOUND200, A
200 FOR T=1 TO40 I:NEXTT,S
210 C$(E)=RIGHT$(A$,1)
220 RESTORE
230 NEXT J,Z
240 DATA1E,3T,13A,11I,31N,32M,111S,3131C
250 DATA1111H,131F,311D,1311L,2330
260 DATA1331P,1131F,133W,1113V,313K
270 DATA3111B,331G,1333J,33130,113U
280 DATA311X,3133Y,3311Z,133331,113332
290 DATA111333,111134,111115,311116,331117
300 DATA333118,333319,333330
310 DATA31113-,131313*,31131/,113311
320 CLS:PRINT@169,"MESSAGE ENDS":PRINT@233,"READY FOR LIST(Y/N)";:INPUTD$
325 IF LEFT$(D$,1)<>"Y"THEN 430
340 CLS
```

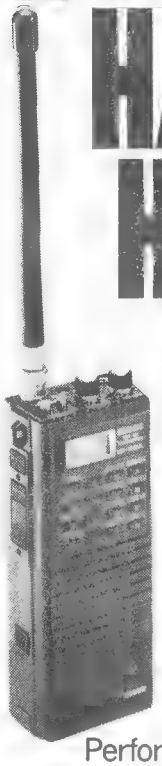
```
350 PRINT PRINT:PRINT C,
360 FOR Z 1 TO 10
370 PRINT"          ",
380 FOR J=1 TO 5
390 L=E+1
400 PRINTC$(E),
410 NEXTJ PRINT
420 NEXT Z
425 SOUND 130,4
430 PRINT@400,"RUN IT AGAIN(Y/N)";:INPUTD$
440 IF LEFT$(D$,1)<>"Y" THEN RUN
450 E=0 GOTO80
```

PROGRAMME 2:

by Bob Knight VK4KRK

```
10 CLEAR 1000
20 CLS:INPUT"NUMBER OF WORDS PER MINUTE?YOU  MAY SELECT 6 OR 12.";A
30 IF A<>6 AND A<>12 THENPRINT"I SAID 6 OR 12, SILLY!":FORX=1TO2500:NEXT:GOTO20
40 IF A=6 THEN B=2:C=6:L=2
45 IF A=12 THEN B=1:C=3:L=1
50 PMODE 4,1:PCLS:SCREEN1,1
70 A$=INKEY$
80 IF A$="A" THEN PCLS: SOUND 190,B:SOUND 255,L:SOUND 190,C:LINE(80,160)-(128,40
),PSET:LINE(128,40)-(176,160),PSET:LINE(96,120)-(160,120),PSET
90 IF A$="B"THEN PCLS: SOUND 190,C:SOUND255,L:SOUND 190,B:SOUND 255,L:SOUND 190,
B:SOUND 255,L:SOUND 190,B:LINE(96,40)-(96,160),PSET:CIRCLE(96,68),56,1,.53,.75,.
25:CIRCLE(96,128),60,5,.57,.75,.25
100 IF A$="C"THEN PCLS: SOUND 190,C:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,B:CIRCLE(128,100),60,5,1.2,.1,.9
110 IF A$="D"THEN PCLS: SOUND 190,C:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,B:LINE(96,40)-(96,160),PSET:CIRCLE(96,100),64,5,.95,.75,.25
120 IF A$="E"THEN PCLS: SOUND 190,B:LINE(96,40)-(96,160),PSET:LINE(96,40)-(160,4
0),PSET:LINE(96,96)-(144,96),PSET:LINE(96,160)-(160,160),PSET
130 IFA$="F" THEN PCLS: SOUND 190,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,B:LINE(96,40)-(96,160),PSET:LINE(96,40)-(160,40),PSET:
LINE(96,96)-(144,96),PSET
140 IF A$="G" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,B:LINE(128,112)-(177,112),PSET:LINE(177,112)-(177,133),PSET:CIRCLE(128,100),60
,1,1,.1,.9
150 IF A$="H" THEN PCLS:SOUND 190,B:SOUND255,L:SOUND 190,B:SOUND  255,L:SOUND 19
0,B:SOUND 255,L:SOUND 190,B:LINE(96,40)-(96,160),PSET:LINE(160,40)-(160,160),PSE
T:LINE(96,104)-(160,104),PSET
160 IF A$="I" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,B:LINE(128,40)-(128,16
0),PSET:LINE(124,40)-(132,40),PSET:LINE(124,160)-(132,160),PSET
170 IF A$="J" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,C:LINE(160,40)-(160,123),PSET:CIRCLE(128,120),33,1,1,.
03,.5:LINE(128,40)-(192,40),PSET
180 IF A$="K" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,C:LINE(96,40)-(96,160),PSET:LINE(160,40)-(96,104),PSET:LINE(100,100)-(160,160)
,PSET
190 IF A$="L" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,B:SOUND 255,L:SOUND 190,B:LINE(96,40)-(96,160),PSET:LINE(96,160)-(160,160),PSE
T
200 IF A$="M" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,C:LINE(80,40)-(80,160)
,PSET:LINE(80,40)-(128,160),PSET:LINE(176,40)-(128,160),PSET:LINE(176,40)-(176,1
60),PSET
210 IF A$="N" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,B:LINE(96,40)-(96,160)
,PSET:LINE(96,40)-(160,160),PSET:LINE(160,40)-(160,160),PSET
220 IF A$="O" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,C:CIRCLE(128,96),60,5,1
230 IF A$="P" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,B:LINE(96,40)-(96,160),PSET:CIRCLE(96,68),55,5,.54,.75
,.25
240 IF A$="Q" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,B:SOUND 255,L:SOUND 190,C:CIRCLE(128,96),60,5,1:LINE(140,132)-(164,156),PSET
250 IF A$="R" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,B:LINE(96,40)-(96,160),PSET:CIRCLE(96,68),55,1,.54,.75,.25:LINE(96,96 )-(150,1
60),PSET
260 IF A$="S" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,B:CIRCLE(128,64),24,1,1,.25,.88:CIRCLE(128,124),36,1,1,.75,.39
270 IF A$="T" THEN PCLS:SOUND 190,C:LINE(128,40)-(128,160),PSET:LINE(80,40)-(176
,40),PSET
280 IF A$="U" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,C:LINE(167,40)-(167,122),PSET:CIRCLE(128,120),40,1,1,.02,.49:LINE(89 ,122 )-(8
9,40),PSET
290 IF A$="V" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,B:SOUND 255,L:SOUND 190,C:LINE(80,40)-(128,160),PSET:LINE(176,40)-(128,160),PS
ET
300 IF A$="W" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,C:LINE(80,40)-(104,160),PSET:LINE(128,40)-(104,160),PSET:LINE(128,40)-(152,160
),PSET:LINE(176,40)-(152,160),PSET
310 IF A$="X" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,B:SOUND255,L:SOUND 190
```


THE WORLD CLASS 2 METRE HAND HELD



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ICO02

```
,B:SOUND 255,L:SOUND 190,C:LINE(80,40)-(176,160),PSET:LINE(176,40)-(80,160),PSET
320 IF A$="Y" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,C:LINE(80,40)-(128,100),PSET:LINE(128,100)-(128,160),P
SET:LINE(176,40)-(128,100),PSET
330 IF A$="Z" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,B:SOUND 255,L:SOUND 190,B:LINE(80,40)-(176,40),PSET:LINE(176,40)-(80,160),PSET
:LINE(80,160)-(176,160),PSET
340 IF A$="1" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 190,C:LINE(116,52)-(128,40),PSET:L
INE(128,40)-(128,160),PSET:LINE(116,160)-(140,160),PSET
350 IF A$="2" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 190,C:CIRCLE(128,72),32,1,1,.5,.12
5:LINE(150,94)-(96,160),PSET:LINE(96,160)-(160,160),PSET
360 IF A$="3" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 190,C:CIRCLE(128,72),32,1,1,.6,.25
:CIRCLE(128,136),32,1,1,.75,.43
370 IF A$="4" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 190,C:LINE(176,128)-(96,128),PSET:
LINE(96,128)-(160,40),PSET:LINE(160,40)-(160,160),PSET
380 IF A$="5" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 190,B:LINE(160,30)-(96,30),PSET:LI
NE(96,30)-(96,78),PSET:CIRCLE(116,124),52,1,1,.7,.36
390 IF A$="6" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 190,B:CIRCLE(128,100),35,1,1.7,.07
,.85:CIRCLE(128,124),31,1,1,.5,0
400 IF A$="7" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,C:SOUND255,L:SOUND 190
,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 190,B:LINE(96,40)-(160,40),PSET:LIN
E(160,40)-(144,160),PSET
410 IF A$="8" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 190,B:CIRCLE(128,68),28,1,1:CIRCLE
(128,128),32,1,1
420 IF A$="9" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 190,B:CIRCLE(128,100),35,1,1.7,.6,
.38:CIRCLE(128,76),31,1,1,0,.63
430 IF A$="0" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 190,C:CIRCLE(128,96),60,5,1:LINE(1
76,40)-(80,160),PSET
440 IF A$="," THEN PCLS:SOUND 190,C:SOUND255,L:SOUND 190,C:SOUND 255,L:SOUND 190
,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 190,C:CIRCL
E(176,160),12,1,1:PAINT(176,160),1,1:LINE(188,160)-(180,180),PSET
450 IF A$="." THEN PCLS:SOUND 190,B:SOUND255,L:SOUND 190,C:SOUND 255,L:SOUND190,
B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 190,C:CIRCLE
(176,160),12,1,1:PAINT(176,160),1,1
460 IF A$="?"THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 190
,C:SOUND 255,L:SOUND 190,C:SOUND255,L:SOUND190,B:SOUND255,L:SOUND190,B:CIRCLE(12
8,80),35,1,1,.625,.25:LINE(128,115)-(128,150),PSET:CIRCLE(128,160),4,1,1:PAINT(1
28,160),1,1
470 IF A$="^" THEN PCLS:SOUND 190,C:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 19
0,C:SOUND 255,L:SOUND 190,B:SOUND 255,L:SOUND 190,C:PMODE1,2:CLS:SCREEN0,1:PRINT
@204,"START SIGS":FOR X = 1 TO 2200:NEXT:GOTO 50
480 IF A$="@" THEN PCLS:SOUND 190,B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 19
0,B:SOUND 255,L:SOUND 190,C:SOUND 255,L:SOUND 190,B:PMODE1,2:CLS:SCREEN0,1:PRINT
@205,"END SIGS":FORX=1TO2200:NEXT:GOTO50
490 IFA$="/"THENPCLS:SOUND190,B:SOUND255,L:SOUND190,B:SOUND255,L:SOUND190,B:SOUN
D255,L:SOUND190,B:SOUND255,L:SOUND190,B:SOUND255,L:SOUND190,B:SOUND255,L:SOUND19
0,B:SOUND255,L:SOUND190,B:PMODE1,2:CLS:SCREEN0,1:PRINT@206,"ERROR":FORX=1TO2200:
NEXT:GOTO50
500 IF A$="*"THEN A=0:GOTO 530
510 IF LEN(C$)>A GOTO 550
520 GOTO 70
530 PMODE1,2:CLS:SCREEN0,1:PRINT"INSERT 249 CHARACTERS HERE."
540 LINE INPUT C$
550 A=A+1
560 A$=MID$(C$,A,1)
570 PMODE 4,1:PCLS:SCREEN1,1:GOTO 80
```

PROGRAMME 3:

by Geoff Hudson VK3CGH

```
100 REM       This morse practice program allows the user to practice
110 REM reception of random 5 letter groups. Characters should be sent
120 REM at a speed close to that at which reception will ultimately be
130 REM required. The average transmission speed will then be adjusted,
140 REM to that specified, by varying the gap between characters & words.
150 DIM L$(50),C(50,5),S$[80] ' S$ can be up to 80 characters long
160 REM
170 REM Read in the character set to be used
180 GOSUB 350
190 REM
```

● **Cont. from Page 12**

for 'START SIGNALS', '@' for 'END SIGNALS', and '/' for 'ERROR SIGNAL'. To activate the storage facility, press ''. Text is then displayed confirming that the storage mode is activated."*

The final programme is from Geoff Hudson VK3CGH. Although developed for an HP 87 it could easily be modified for other computers. The programme is designed to generate random 5 character groups.

Geoff put a lot of effort into ensuring that the timing of the characters was optimised. This is shown by the two input statements — one for the overall speed of the character groups (line 610) and the other for the speed of the individual characters (line 630). Thus it is possible for a beginner to set a slow overall rate, say 3-4 words per minute, but have the individual characters sounded at a 10 words per minute rate.

It should be noted that in all these programmes, care should be taken in setting up the timing loops for the characters. Also important are the gaps between the characters, and between the words. This is especially important when converting a programme from one computer to another.

I hope that these three programmes provide some ideas on Morse tuition, and enable you to upgrade your CW skills.

AR

TRAPPED DIPOLE — W3DZZ OR G8KW?

A mild controversy concerning the inventor of the "trap" or "trapped" dipole has arisen as a result of references in *Radio Communication* to the "W3DZZ" trap dipole. Mr R G Shears G8KW, the managing director of KW Communications Ltd, has written to the Society pointing out that a similar antenna known as the "G8KW multiband trapped dipole", developed by himself, was the subject of a provisional patent application in July 1957. The development of this type of antenna was commenced by Mr Shears in 1942/4 during the course of duty with the Royal Signals. He says:

"To my certain knowledge at that time, the use of traps in aerials was quite unique . . . a pair of traps was used in a dipole design for 'day and night' frequencies, eg 3 and 7 MHz.

"After serving abroad until 1950, further development of trapped dipole aerials was undertaken at my QTH near Dartford, Kent, and by 1954 the multiband trap dipole for 10, 15, 20, 40 and 80 metres, as we know it today, was being used with excellent results. In 1956, KW Electronics Ltd was formed, and a year later the company entered the amateur radio market. One of the products was to be the unique multiband trap dipole, and an application for a patent was made. Since then many thousands of aerials and kits have been sold covering the 'G8KW multiband trap dipole' design and commercial two, three and four-frequency trapped dipoles. Literature and dimensions were freely available from the company, including polar diagrams. The latter is something that most published articles have not mentioned.

"Although many references have been made to the G8KW trap dipole in Radio Communication, *it is apparent that the writers of a number of articles on (the subject) have used the ARRL* Antenna Handbook *as a reference and this mentions only the W3DZZ design or variations thereof."*

It would appear that radio amateurs over the years should have been referring to the "G8KW trap dipole" instead of the "W3DZZ trap dipole". If this is indeed the case, the Society is pleased to make the correction as a tribute to one who has achieved a great deal for amateur radio for many years and whose products are world famous.

from Rad Com — September 1984

AR

```
200 REM Set up run parameters
210 GOSUB 600
220 REM
230 REM Get text to be sent
240 GOSUB 830
250 REM
260 REM And send the text
270 GOSUB 950
280 PRINT S$
290 GOTO 240
300 REM ******************************************
310 REM
320 REM Read in the Morse code and set up arrays
330 REM
340 REM ******************************************
350 DATA A.-,B-...,C-.-.,D-..,E.,F..-.,G-..,H....,I..,J.---,K-.-
360 DATA L.-..,M--,N-.,O---,P.--.,Q--.-,R.-.,S...,T-,U..-,V...-
370 DATA W..-,X-..-,Y-.--,Z--..
380 DATA "0-----","1.----","2..---","3...--","4....-"
390 DATA "5.....","6-....","7--...","8---..","9----."
400 DATA END-OF-DATA
410 FOR I=1 TO 50
420   FOR J=1 TO 5
430     C(I,J)=0
440   NEXT J
450 NEXT I
460 I=0
470 READ C$
480 IF C$="END-OF-DATA" THEN RETURN
490 I=I+1
500 L$(I)=C$[1,1]
510 FOR J=2 TO LEN (C$)
520   IF C$[J,J]="." THEN C(I,J-1)=1 ELSE C(I,J-1)=2
530 NEXT J
540 GOTO 470
550 REM ****************************************************
560 REM *
570 REM *   Get speed required and work out dot/dash length
580 REM *
590 REM ****************************************************
600 PRINT "Speed required? (WPM)"
610 INPUT S1
620 PRINT "Character transmission rate?"
630 INPUT S2
640 IF S2<S1 THEN PRINT "S1 must be >= S2!" @ GOTO 600
650 T1=1045/S2 ! Dot length in mS = 60*1000/(wpm*57.5)
660 T2=T1*S1*7.7*5 ! Time per minute that beeper sounds
670 T3=60000-T2
680 G1=3*S1*4+7*S1 ! Number of gaps per minute (In dot-times)
690 G1=T3/G1 ! Unit gap time
700 D1=G1*3 ! Gap between characters
710 D2=G1*7 ! Gap between words
720 REM
730 REM Calculate beeper values for this machine
740 F1=600 ! 600Hz
750 B1=613062.5/(11*F1)-134/11 ! 600Hz pitch...believe it or not
760 B2=T1*F1/1000 ! Beep time for a dot
770 RETURN
780 REM ****************************************************
790 REM *
800 REM *  Get the next set of text to be sent
810 REM *
820 REM ****************************************************
830 REM
840 FOR I=1 TO 5
850   I1=1+INT (RND *36)
860   IF I1>36 THEN I1=36
870   S$[I,I]=L$(I1)
880 NEXT I
890 RETURN
900 REM ****************************************************
910 REM *
920 REM *  Send the text stored in S$ at the required speed
```


WORLD CLASS 2 METRE COMPACT MOBILE

When the engineers at ICOM designed the IC-27A, they knew you would have almost no room to mount it. Take a good look at the dashboard in your car. ICOM have packed a processor controlled, 25 watt VHF mobile into just 58 cubic inches. Think about it, your IC-22S is 87 cubic inches and it doesn't rank in the same class. The 27A offers 32 CTCSS frequencies, scanning, memories, even a speech synthesizer to aid blind operators.

ICOM
The World System

Look for the Dealer list in this magazine or phone ICOM on (03)51 2284

IC 004

```
930 REM *
940 REM ***************************************************
950 REM
960 FOR I=1 TO LEN (S$)
970   X=NUM (S$[I,I]) ! Get offset into data array
980   IF X>64 THEN K=64 ELSE K=21
990   K=X-K
1000   FOR B=1 TO 5 ! Step through each element in character
1010     IF C(K,B)=1 THEN BEEP B1,B2
1020     IF C(K,B)=2 THEN BEEP B1,B2*3
1030   NEXT B
1040   WAIT D1 ! Wait D1 mSecs...intercharacter gap
1050 NEXT I
1060 WAIT D2 ! Wait D2 mS...interword gap
1070 RETURN
```

LOG PERIODIC BALUN

Jim Wilkinson, VK6AWJ
3 Keddie Street, Bunbury, WA 6230

I required a balun for a six metre log periodic antenna and finished with the design shown here. It is very simple but as it is complete in itself it is possible to vary its design to suit and also lends itself to measurements directly on the input.

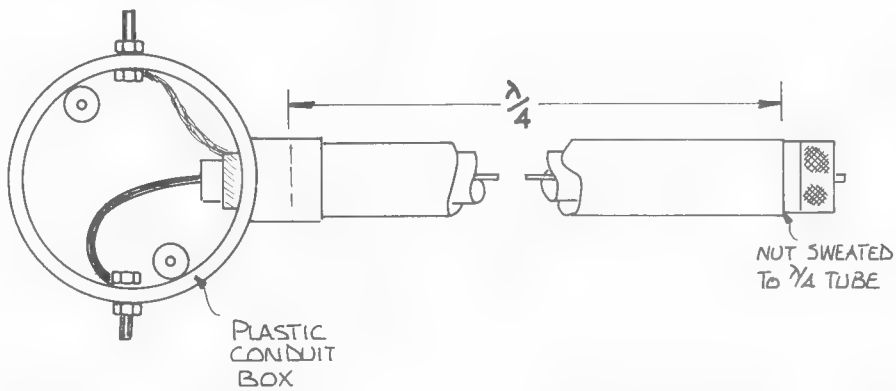


Figure 1 — Balun

You will require a length of tubing which will be a snug fit over the nut of the input connector of your choice — probably a PL259 or "N" series — the female N to cable would be ideal allowing the ready insertion of test equipment; a plastic conduit box which will fit over the other end of the section and two nuts and bolts — washers etc. The cable would be RG8 or similar. Assembly is as per diagram, be sure all joints are well sealed before connecting to antenna.

I have not tried it but there should be no reason why the whole thing could not be scaled down using a BNC connector and smaller diameter tubing. There may be a problem with that type of conduit box however.

The principle will work at any frequency where construction is practical. To assemble:

1 Cut tube to quarter wavelength.
2 Sweat nut of input connector to tube.
3 Prepare coax and terminate on input connector.
4 Assemble cable in tube and attach conduit box then terminate.

AR

THUMBNAIL SKETCHES

Peter Brown, VK4PJ
16 Bede Street, Balmoral, Qld., 4171

GORDON NICOLL HARLEY. 4GH 1928. VK4GH.

Many "Old Timers" will be pleased to see this very recent photo of Gordon, one of the most popular amateurs of the 1920-30 years, and to know that he is still around.

Gordon was born in August 1901 and passed his AOCP in February 1928, the fee being two shillings and sixpence. Bands permitted were 80, 32 and 20 metres with an input of 10 watts.

"Wireless" became an interest after reading "The Boy's Own Annual", at about 12 years of age, and an article on a spark transmitter for use by Boy Scouts.

The first receiver used a variable condenser, two cocoa tins of different size with the inner covered with brown paper. As funds became available, and valves, variable condensers were made from sheet zinc, brass rod and ebonite. Fixed condensers from sheet mica, tinfoil and brass screws.

In the 1920s, to deal in "wireless" gear a "dealers" license, costing five pounds from the PMG, was necessary.

Gordon obtained this licence about 1924 with the intention of making and selling, a standard three valve receiver, but with the Depression looming, Gordon went into teaching, where he served in Ipswich, Didcot and Maryborough, to retire.

The first Tx was a TPTG circuit with two B406 tubes in parallel using "B" batteries for 135 volt HT to give an input of 1.1 watts. . . . and so to UX201 tubes where declining emission was regained by raising filament volts to 10 when the tubes gave up. To overcome the "B" battery problem Gordon used some gunmetal moulds to cast lead plates, used in one inch teat tubes . . . he also used lead strips in vaseline jars . . . finally to obtain 96 volts. Norm, VK4KO, and Gordon together ground crystals from old spectacle lenses for their transmitters.

Gordon favoured an end fed Zepp antenna and considers that the days when he could broadcast music after broadcast stations shut down were the days of real sport.

At one time Gordon was well known as a winemaker.

AR

CONVERSION OF MTR25 TO SIX METRES

David Waring, VK3ANP
Banksdale Road, Hansonville, Vic 3675

This article is prompted by the availability as disposals through the Victorian Division of the WIA the low band FM transceiver designated MTR25.

The unit is a hybrid being all solid state with the exception of three valves in the transmit power amplifier section.

Power drain on transmit is 8 amps and output power is 25 watts.

With the Divisional Broadcast in VK2 and VK3 available on 52.525 MHz and six repeaters now in *two* states you too can get on 6 metres FM for a very reasonable outlay.

Copies of the circuit diagram and equipment description are available from the Victorian Division of the WIA.

CIRCUIT DESCRIPTION

The receiver is all solid state using double conversion. The first IF is at 10 MHz with a crystal filter, the second IF is at 455 MHz. Audio output power is three watts.

The transmitter uses phase modulation and is transistorised in the frequency determining low level stages and modulation section. For power amplification, valves are used.

RECEIVER CONVERSION

You will need to obtain an eight pin plug to fit the power socket. The top row of contacts are soldered together and joined to the negative lead, the bottom row are joined and soldered to the positive lead.

The units as supplied have the second conversion crystal installed. Do not adjust any coils in either the 10 MHz IF strip or the 455 MHz strip.

The units as supplied will have been operational in the 70-85 MHz region.

First Conversion Crystal Frequency is calculated from the formula:

$$f_c \quad \frac{\text{SIGNAL} - 10.7}{2}$$

I suggest you order the crystal from a commercial supplier indicating the frequency required also the type of equipment it is to be used in My crystals were purchased from Bright Star Crystals. The RF, Mixer and Osc Strip is located by taking the unit out of its case and setting on a bench right way up.

The strip is located as running across the width of the chassis and has nine coils adjusted from the top and identified as Part 1J61966

Step 1 — Unsolder the coax coming from the filter unit to the aerial relay.

Step 2 — Unsolder the supply wires (red and black in my case) attached to the three terminal strip. Note carefully the correct connection.

Step 3 — Unsolder the leads to the crystal filter (green and yellow) and carefully note the correct connection.

Step 4 — Remove the eleven screws holding the strip to its shielding box and carefully remove the strip and proceed as follows, checking the frequency of each as you go.

1st Oscillator coil 40L5 change 4.7 pF capacitor to 22 pF; frequency 21 MHz.

2nd Oscillator coil 40L6 change 15 pF capacitor to 33 pF; frequency 42 MHz. 42 Oscillator coil 40L7 change 18 pF capacitor to 33 pF; frequency 42 MHz. 42 Oscillator coil 40L8 change 22 pF capacitor to 33 pF; frequency 42 MHz.

The remaining coils in the RF section are set in the 52 MHz range and those numbered 40L1 to 40L5 are set in the 52 MHz range and require the capacitors across each to be changed to 47 pF.

This completes the mechanical side. The strip can be replaced making sure there are no shorts and the coax and leads removed are resoldered to the correct places.

Alignment is the next step and should present no problems if you have the coils adjusted somewhere near the approximate frequencies. First get the oscillator operating and adjust the RF section using a signal on 52.525 MHz. Getting a local amateur to supply an accurate 52.525 MHz signal, connect a 50 uA meter to the discriminator test point on board 3R61965, adjust crystal for a zero-reading on the meter. Go over the alignment using a weak signal on 52 525 MHz.

TRANSMITTER CONVERSION

Do not adjust the deviation tab. pot.

$$\text{Transmit crystal frequency} = \frac{\text{SIGNAL FREQ.}}{24}$$

Commence by removing the four screws holding the cover over the modulator exciter section. Remove board and proceed as follows —

1 Change capacitor 6C6 to 330 pF.

2 Add a 22 pF capacitor in parallel with capacitor 6C13.

3 Change capacitor 6C21 to 390 pF.

At this stage turn the chassis upside down and identify coil 50L2 in the anode circuit of the 12BY7, add 10 pF in parallel and with the GDO adjust to approximately 26 MHz.

The grid coil 50L3 of the 12AQ5 add 10 pF in parallel and adjust to 26 MHz.

Replace coil 50L4 in the anode of the 12AQ5 with a new coil of nine turns having the same diameter wire and former; adjust to 52.525 MHz.

Coils 50L7 and 50L8 remain unchanged.

Coils 50L9 in grid of 6883 add 10 pF in parallel and adjust to 52.525 MHz.

Put modulator/exciter board back in position and resolder leads. Put cover back on.

With set right way up remove cover off 6883 and carefully remove the valve, then remove anode coil 50L11.

Wind new anode coil having nine turns using same size former and diam wire, replace valve and cover. Adjust to 52.525 MHz.

TUNE UP

Connect SWR bridge and 50 ohm dummy load to antenna socket.

1 Plug a 0-1 mA meter to 1st doubler input and tune 6TR1 + 6TR12 for maximum reading.

2 Repeat for 2nd doubler input-adjust 6TR3 and 6TR4.

3 Plug a 1 mA meter into tripler and peak 6TRs and 50L1 for a maximum reading.

4 Plug a 10 mA meter into 3rd doubler grid, peak 50L2 + 50L3 for a maximum reading.

5 Plug a 100 mA meter into 3rd doubler anode and adjust capacitor 50C22 for maximum reading.

6 Plug 10 mA meter into PA grid and peak capacitor 50C26 for maximum reading.

7 Plug 250 mA meter in PA anode adjust capacitors 50C31 and 50C39 for maximum reading on SWR meter. Power should be in the vicinity of 25 to 30 watt.

This completes the conversion of the unit and provided you have taken reasonable care with your work the unit should be as good as its original specifications.

For an antenna, a ground plane or beam antenna with dimensions given in the various handbooks would be suitable or the two ⅝ wavelengths in phase as described in Amateur Radio September 1983 would be excellent.

AR

FROM THE USA

A proposal to permit novice phone operation on 220 MHz has been submitted to the FCC by WA2MCT and WD5DON as a Petition for Rulemaking. Opposition to their proposal since it was first suggested has been very strong.

In an unrelated move, a 224.750 MHz experimental license has been granted to the University of Illinois' Wallops Island, Virginia, test facility "to support research in ionospheric radio propagation required by US Government contract."

420-430 MHz is no longer available to US amateurs located within 120 km of the Canadian border. The ban results from Canada's decision several years ago to allocate the bottom 10 MHz of the 70 cm band to land mobile, and a consequent agreement between its DOC and FCC to protect Canadian land mobile users from possible US amateur interference.

Included in the protection band are such major US cities as Seattle and Duluth, most of Michigan (including Detroit), Toledo, Cleveland, Erie, at least half of the states of New York, Vermont, and New Hampshire, and most of Maine, including Bangor! The same band of protection also extends along the Alaska-Canada border, encompassing Juneau and Ketchikan.

A third amateur has been named to become an astronaut by NASA. Ron Parise WA4SIR, a scientist employed by NASA at Greenbelt, Maryland, is scheduled to make his first trip on the Space Shuttle in 1986. He joins W5LFL, who conducted the first amateur operation from space late last year, and W0ORE, who's up for his first Shuttle trip next year.

Amateur operation during W0ORE's upcoming Shuttle flight has been formally proposed by the ARRL and AMSAT. In their joint proposal the two groups stated their goal was to involve as many Amateurs as possible, particularly through school and club stations. In addition to 2 metre FM such as W5LFL used, a 10 metre downlink for 2 metre audio and SSTV pictures from the Shuttle has also been suggested. NASA's decision is expected soon.

ARRL's petition to have Cable TV kept off the Amateur bands has been rejected by the FCC. However, in their rejection the Commissioners put the cable TV industry firmly on notice that it has an obligation to prevent and remedy leakage problems, to all services.

Adapted from Ham Radio — August 1984

AR

REPORT ON VK2 SEMINAR

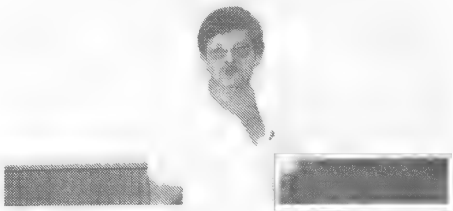
On Saturday 22nd September last a most successful Seminar was held at Amateur Radio House — the VK2 Division Headquarters in Parramatta. Its theme — "Amateur Radio —Towards New Horizons" — presented the large audience with a range of views on our vast hobby.

Photographs by Les Pall VK2KGP

The proceedings were opened by Divisional President Jeff VK2BYY at 10 AM. It had been some time, Jeff indicated in his introduction, since the Division had presented such a forum and he felt it fitting that the first speaker was to be Roger Harrison VK2ZTB who had been responsible in the past for also introducing the FACTS Symposium into VK2. Roger chose as his theme — in his words — a semi technical talk, a little future shock — "The Social and Technical Imperatives that Challenge Amateur Radio". With the future holding reduced working hours resulting in an increase of leisure time, Roger explained in detail its impact on electronic based hobbies, a subject he knows well from his position as Editor of ETI. At the end of his talk Roger went on to advise that he had recommenced the production, as a quarterly publication, of 6-UP, which caters for VHF/UHF interests. Details may be obtained by writing to Teknidata, PO Box 844, North Sydney, NSW, 2060.

Roger Harrison VK2ZTB

The second speaker in the morning was Jim Swetlikoe VK2BVD, Chairman of Sydney Amateur Digital Communications Group, with his subject being "Packet Radio". Jim outlined the background and technology of this mode and the stage of development and achievement reached in Australia.



Jim Swetlikoe VK2BVD

Following the lunch break, the keynote address was given by Colin Oliver, Chief Executive Officer in the Department of Communications, Canberra on "The Radio Communications Act". Colin outlined the background and procedures in the introduction of new legislation. He explained the problems with the 1905 Wireless Telegraphy Act and how the Radiocommunications Act 1983 overcomes them. The immense interest in the subject by those present was reflected in the question session which had to be terminated to enable the final speaker to fit into the programme.

Colin Oliver

The afternoon concluded with Lyle Patison VK2ALU, Co-ordinator of the Illawarra Amateur Radio Society Moonbounce Project. Lyle outlined the fifteen year history of their work and then went on to detail the requirements to get a signal to the moon and back. Quite a challenge, said Lyle, for it is the only object out there and if you don't make it then you have no chance of getting back.

Lyle Patison VK2ALU

In closing Jeff thanked the speakers for the excellent coverage of their subject and the members for attending. With next year being the 75th anniversary of the formation of the Institute in Sydney during March 1910, a further series of Seminars will be presented and now is the time to either suggest topics or volunteer yourself to take part.

The lectures were video taped and will become available later through the Federal and Divisional video library systems. The release date will depend upon when they can be edited and transferred to the domestic formats. In the meantime plan to attend the next in the series in 1985.

AR

Photograph by Ken McLachlan VK3AH

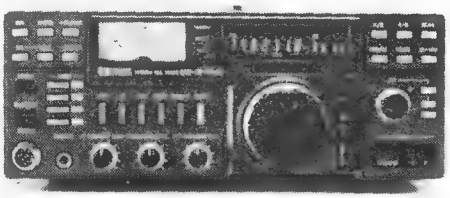
G FOR GEORGE

Jim Linton VK3PC,
4 Ansett Crescent, Forest Hill, Vic. 3131.

Following hours of dedicated work restoring a transmitter and receiver Maurie O'Keefe VK3KO this month presents the equipment to the Australian War Memorial in Canberra. At the same time Maurie, who was an RAAF wireless operator in the No 460 Squadron based in the English village of Binbrook during World War 2, will pay a unique tribute to his former Squadron.

● Cont. on Page 20

THE WORLD CLASS 2 METRE BASE



Do you remember the IC-211? The boys at ICOM do. You see, it set the pace for 2 metre base station performance many years ago. Optically chopped tuning, processor control, digital PLL, and many features at that time unheard of. In 1984 ICOM are still setting the same high standards for 2 metre base station performance. Dual VFO's, multi mode, 10 Hz PLL tuning are a few of the basic features. This world class radio is supported by a large range of options, many can be seen at your local ICOM dealer.

ICOM
The World System
Look for the Dealer list in this magazine or phone ICOM on (03) 51 2284
IC006

Maurie visited Canberra two years ago and saw the Lancaster Bomber — G for George — on display had no radio and took on the task of doing something about it.

Photograph courtesy Australian War Memorial

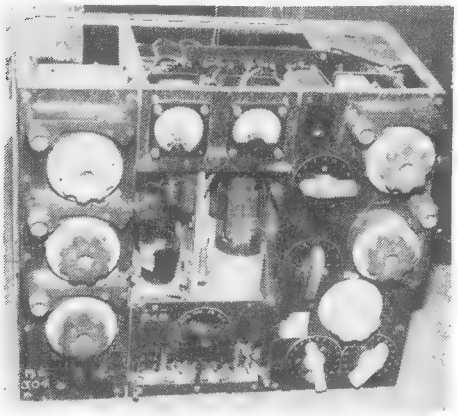
G for George taken in England when the aircraft was still operational.

The bomber, which was presented to Australia by the British Government, is significant because it's believed to be only one of three in the world that flew nearly 100 operations (bombing raids) and survived although it was hit by ground flak on occasions.

The No 460 Squadron had a casualty rate of about seventy percent during its operations and Maurie said the restoration work would be his tribute to the Squadron.

"I feel very satisfied," said Maurie who was only twenty-years-old when he joined the Squadron a month before the war ended.

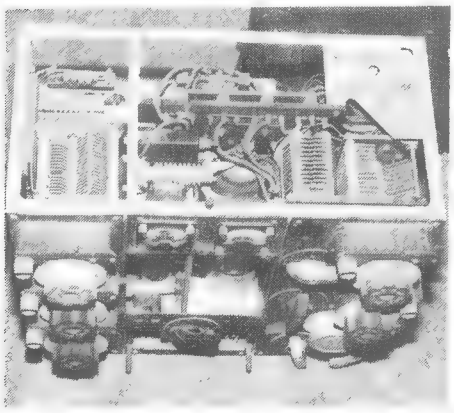
The job of finding the right equipment began when the Wireless Institute of Australia was asked to put a request over its weekly broadcasts. Another method of spreading the word was through Laurie Gardiner VK3YDE of Ham Radio Supplies — Melbourne's war surplus specialists.



A T1154 transmitter of the type used in the Lancaster was found with Bill Babb VK3AQB.

"It came complete with spider webs but without its front panel meters and needing a lot of work and re-wiring," he said.

Maurie told the 460 Squadron Association of Melbourne of the task he was about to undertake and the association bought the transmitter for $50. It



then took him two years and $400 to get it back into working order.

First he needed a circuit diagram and contacted the manufacturer, Marconi in England and they sent a photocopy of the transmitter's handbook.

After getting the transmitter in working order Maurie put his efforts to the test by making contact on air with John Brooks VK4APZ using CW. The T1154 has a VT105 valve as master oscillator, with two VT104s in the final, and grid modulated by another VT105 producing about 80 watts.

Laurie Gardiner was meantime trying to find a matching R1155 receiver used in the Lancaster. He had told Ray Pulford VK3DL who knew the receiver and later by chance was servicing a TV set when his customer mentioned how a deceased neighbour had previously done the repairs. The customer explained how the neighbour had a lot of equipment in his garage — Ray investigated and found a R1155 which had been sitting there for thirty years, covered in dust.

Another letter to Marconi for a circuit diagram was successful with them sending Maurie information on the receiver.

A number of people played their part in locating the T1154 and R1155, and its various parts.

"I walked all over town looking for panel meters to put back in the transmitter.

"Max White VK3ZCW had the exact meters and kindly supplied them free for the project," said Maurie.

Bitten by the restoration bug Maurie will, next year, begin restoring radio equipment for another aircraft.

"I told the Australian War Memorial to let me have six months rest and I'll then restore radios for their Mosquito bomber," said Maurie.

Robbie Warren VK3NXW of Preston has donated a second T1154 for the Mosquito project.

This aircraft was a fighter-bomber used to mark bombing targets with flares making for more accurate operations by the Lancasters — they were also fitted with a T1154 and R1155.

Curator at the Australian War Memorial, Jim Heaten, highly praised the voluntary work carried out by Maurie.

"We're absolutely delighted and amazed at the job he's done in restoring the radio equipment and having it in a working condition," he said.

An aircraft fitter from World War 2 was working three days a week restoring the interior of G for George.

Mr Heaten said: *"Without the radio equipment — restoration of this aircraft wouldn't have been complete.*

"It's important because the Navigator/Wireless Operator Station position is a focal part of the aircraft's interior."

The War Memorial has a number of aircraft it plans to restore and would like help to locate various pieces of radio and radar equipment. After the war many of these pieces were bought by radio amateurs through disposals sources.

The following is a list supplied by Mark Clayton, acting Curator of Military Technology, who can be contacted at the Australian War Memorial.

The aircraft is the B-25 and the equipment required is: AN/ARN-5, AN/ARN-7, BC-458A, BC-459A, BC-442A (Antenna Relay), BC-453A, BC-453B, BC-454A, BC-455A, BC-966 (SCR 695), RC-43 (Marker Beacons), RC-103 (Radio Set), RC-193 (Marker Beacons), SCR-269 (Radio Compass), SCR-274-N (Command Set), SCR-287-N (Liaison Set), SCR-522 (Radio Set)

AR

. . .

Amateur 1: "By the way, Chuck, have you forgotten that you borrowed my two metre power supply?"

Amateur 2: "No, Tom, I'm a slow forgetter. Give me time and I will."

. . .

What one 807 tube said to another: "What are you going to be when you blow up?"

from Collector & Emitter — March 1984

"THE OTHER INTEREST"

Frank May VK2FMA ex VK2PIO

Over the past three years since taking up amateur radio, my XYL Barbara and I have become involved with the Cashmere Industry. Cashmere is a superfine wool that grows on goats' backs to keep them insulated and warm during the winter months. This wool or down is usually grown under the goat's guard hair and it is an excellent though somewhat expensive fashion wool with long lasting qualities.

Our interest in Cashmere started when our son presented us with a young buck not more than twelve months old.

A daily walk programme was organized around the local neighbourhood, much to the delight of children and to our surprise, we got to know many of our city neighbours.

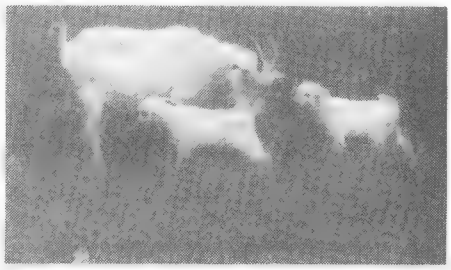
During the first autumn we were puzzled by the fine down appearing as his winter coat. We visited Angora and Cashmere field days in Sydney and were surprised to learn we had a Cashmere bearing animal. In August we had our first crop of Cashmere. As we did not believe in shearing we turned the animal upside down and combed it out!

Time passed by. Our buck was getting restless and a little dirty. Shampoos became a regular feature. The buck, who now had a registered name "Billy May", had some brief love affairs. He has proved his worth as a stud animal. His family like the Cashmere industry in Australia is growing well.

Recently we added to our family, a young lady named "Carla". She also is showing the same potential as "Billy". The old fella, now quite mature, is delighted to have permanent company in the back yard. His demands are less and we do not have the trouble we used to have when he frequently tested the fence with his horns. No more wooden poles shaking the coax.

Even the XYL now looks forward to the new season's spinning ahead. It will give the OM a chance to play with his radio, especially as he can now explore new frequencies and new modes.

When we move from Sydney, it will be to goat country free of pollution and firing ranges, and it will be on a hill with a view. What more could a radio amateur want than to watch his goat family grow, with his feet on the amplifier and hand on the mike while his loving wife attends to his woollen needs.



Watching the family grow.

Billy May — aged 3 years

IT'S "BOTTOMS UP" FOR DX

Bruce R Bathols VK3UV
6 Ann Court, Aspendale, Vic, 3195

You don't have to have 52 elements, but it sure helps!! Such is the story of Trevor Pitman VK3KEG, from Frankston Victoria. Trevor's occupation is a lecturer in motor mechanics at Nissan, Dandenong, and outside of working hours, spends most of his evenings and weekends on the bottom end of two metres and seventy centimetres.

Trevor's antenna system.

The array is four by thirteen elements long yagis on two metres, and the cross boom is erected at approx 10.5 metres above ground, mounted on a crank up/tilt over tower.

The antenna system is matched to 50 ohms via half wave phasing sections, and fed with 50 ohm coax via a four way diplexer.

The total antenna gain is approx 19-20 dB over a dipole, and although Trevor has only just completed the installation on two metres, he is in the process of constructing a similar array for 70 cm, also to be installed on the same tower.

Trevor's interest in amateur radio began several years ago, having graduated through the CB ranks, and then obtaining a novice licence VK3NMJ about five years ago. He quickly went on to the LAOCP, and was issued with the call VK3YTP. He retained that call for two years. His current call sign VK3KEG, being a combined Limited/Novice licence, in no way reflects his drinking habits, however, he has been known to pay a visit to "the office" on irregular occasions.

Trevor's QTH is one that you might describe as an "ideal VHF location". His house is situated on top of a ridge at Frankston, and is approx 122 metres above sea level.

He states *"I didn't know what I was buying"*, when he purchased the property six years ago.

He has of course proven the benefits of altitude, particularly on VHF and UHF, as he has an uninterrupted panorama of the entire south and south eastern parts of Melbourne and Port Phillip Bay.

To date, Trevor has made two metre SSB contacts with stations in most parts of Victoria, and has regular communications with VK1 and VK2. He also has had QSOs with VK4, VK5 and VK7, but VK6,8,9,0 have so far eluded him.

His main ambition is to work all states, including VK0 and ZL on two metres, in the meantime he is gearing himself up for serious EME moonbounce work, on both two metres and 70 cm.

Trevor also has an interest in the Phase 111 OSCAR-10 satellite, and hears the satellite with a single yagi at very good levels, and with no pre-amplification on the receiver.

Using the four beam array brings OSCAR-10 in well over S9 — an incredible performance.

Not to be left behind though, Trevor also has a TS120 and a dipole on 80 metres, and he does venture into the DC bands from time to time, but his only real interest now is developing the VHF and UHF spectrum further.

His equipment consists of all Icom transceivers on two metres and 70 cm, also solid state 150 watt amplifiers with built in pre-amplifiers on receive.

On the construction side, Trevor is building a high power 400 watt SSB amplifier for two metres using 4CX250Bs, together with a mast head pre-amplifier to alleviate the losses in the coax. This is a necessity for any serious EME moonbounce applications, and like the rest of us, only finds twenty four hours in the day to devote to such projects. At least he has made a start, and expects the amplifiers to be completed before the summer DX period is over.

He is eagerly awaiting the summer DX openings, where he hopes to contact as many DX stations as conditions allow.

Trevor VK3KEG.

At this stage, Trevor is not overly interested in the Ross Hull Contest, but I have no doubts that we will see some excellent scores from him in that area in due time.

Trevor keeps a sharp look at the weather maps, and you can find him most evenings on 144.100MHz and 432.100MHz SSB, and occasionally on 145.050MHz FM.

He has the odd contact through FM repeaters, but prefers to keep off the "telephone channels", except for necessity in maintaining other scheds. Trevor has only one complaint, in that between busy periods of activity around the equinoxes, two metre and 70 cm SSB operation seems to die off. He would like to see more amateurs populate the "bottom end" of those in the so-called "dead" periods.

He says, *"It is surprising just what signals you can hear, if only the signals are there in the first instance"*.

After satisfying his amitions on two metres and 70 cm, (which may take years), he intends to investigate further up from 1296 and higher in due time.

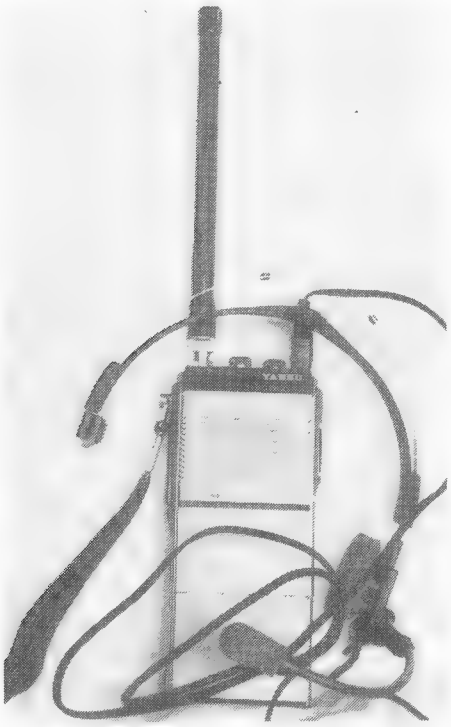
We wish him all the luck, and any failure certainly won't be due to the lack of antenna gain.

See you down on the "bottom end". **AR**

EQUIPMENT REVIEW

Ron Fisher VK3OM,
3 Fairview Avenue, Glen Waverly, Vic. 3150

THE YAESU FT-203R Two Metre Hand Held Transceiver



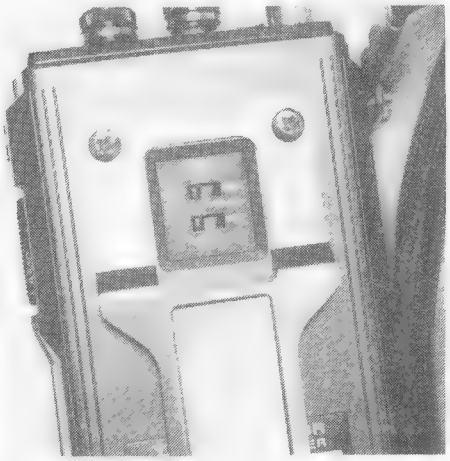
I can just hear you saying, "Surely not another 2 metre hand held transceiver". Well yes, but read on, I am sure you will find this interesting and perhaps a little different to most of the hand held FM transceivers on the market at the moment.

But first as usual let's look at the history of Yaesu 2 metre hand helds. The first, several years ago was the FT-202. This in common with its contemporaries was crystal controlled with six channels. Also, as was usual, you were lucky to get a couple of channels supplied. Soon of course the hunt was on to find those elusive new repeater channels. I guess most have been through the same situation. Then towards the end of 1979, Yaesu released the fully synthesised FT-207. It did all sorts of wonderful things, had a digital readout, memories etc etc. One thing though, if the memory was left switched on the batteries were always flat when you needed to use the thing. But better things were to come. The FT-208 released a couple of years later overcame all the earlier problems. By this time most of the 2 metre hand held transceivers had more facilities than their higher powered mobile counterparts. There were of course exceptions like the IC-2 and the earlier but somewhat similar AR-240.

Of the two, the IC-2 proved very popular with amateurs who wanted full 2 metre coverage but with no frills. Rumour has it that Icom intend to drop the IC-2; perhaps they might reconsider! But even if they do, all is not lost for those who still require a simple 2 metre hand held. The new Yaesu FT-203 will certainly fill the bill.

So now let's have a close look at the FT-203 and see just what makes it tick. It is a compact (almost identical in size to the IC-2) transceiver with thumb wheel frequency selection for MHz, tens of kHz and a five kHz selector button. High (three watts) and low (300 mW) power output is selectable and for the first time in years, an "S" meter. I cannot remember seeing one of these on a hand held since the old Ken KP-202.

Other controls include a combined volume and on/off switch, squelch control and a BNC antenna connector. A push-to-talk bar is on the left hand side and on models with a tone burst facility a separate button above the PTT bar for its operation. On the right hand side is a button to actuate a lamp to illuminate the meter but unfortunately not the thumb wheel frequency selector. At the rear are two slide switches for simplex or repeater ± 600 kHz. The second switch selects the VOX sensitivity.



Rear panel.

Now before you think I have run off the rails and started talking about an entirely different rig, let me explain. VOX on a 2 metre hand held is certainly unusual to say the least, but is available on the FT-203 provided the optional YH-2 headset/boom microphone is used. We will talk about the operation of this later.

The FT-203 is supplied with a 10.8 volt, 425 mA/H Ni-Cad battery pack and a battery case to take six AA dry cells as an option. A rubber helical flexi antenna and a soft protective case are both included as standard equipment as is a plug in battery charger.

THE FT-203 CIRCUIT DESCRIPTION

Due to the excellent instruction book supplied it is possible to get a good look at the works and see what happens. The receiver is the usual double conversion set up with 10.7 MHz and 455 kHz IFs. While it might seem strange, a single bipolar transistor is used as an RF stage feeding the first mixer, also a bipolar through a three section varactor tuned band pass filter. The varactors are controlled from the PLL system. A monolythic filter at 10.7 MHz feeds the second mixer which is included in an IC which also contains the 455 kHz IF, limiter, discriminator, noise amplifier and squelch switching circuit. This certainly makes for a simple receiver circuit with two transistors and one IC making up the basic system.

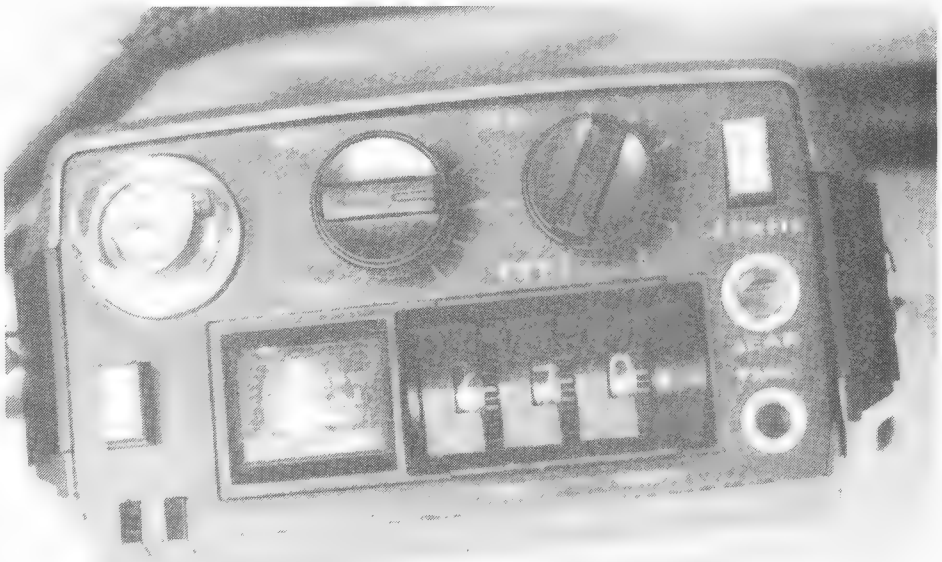
Of course extra components are required for audio output and drive for the "S" meter etc.

The audio input circuitry is a bit more complex than most due to the VOX provision. Again a good part of the action is taken care of by one IC which incorporates the instantaneous deviation control, low pass filter and VOX amplifier. A VCO in the PLL section is modulated with a varactor diode and the output at around 73 MHz is fed to the main transmitter section where it is doubled and amplified to the final output.

Other circuits are the 5 V regulator for the PLL and VOX sections and of course the transmit receive switching control section.

THE FT-203 ON THE AIR

First impressions are excellent. The overall finish of the case and controls is as good as I have ever seen. The battery pack slides off to one side after the spring loaded lock is pushed up. It can however be recharged while in place on the transceiver, and a second connector allows operation of the transceiver while the battery charges. An optional DC-DC adaptor, the PA-3 is required to do this. Unfortunately the otherwise superb manual fell down here as no circuit is supplied of it. As the transceiver normally needs 10.8 V, I assume that it contains a regulator at this voltage supplying the 700 mA or so required plus a 50 mA output for charging all from a 12/13.8 volt car system. It shouldn't be too hard to come up with a suitable circuit.



Top view of the Yaesu FT-203R.

The thumb wheel, or perhaps they should be called finger nail switches are no better or worse than others I've used. You get used to them after a while. Two small LEDs, one green indicates that the squelch has opened on receive, the other a red one indicates transmit. The meter shows relative transmitter power output and received signal strength on a scale of zero to ten. Received audio quality is sharp and clear. The 203 has a very distinctive received sound. I found it a little too toppy for my taste but others who heard it thought it excellent. Try it before you buy. Transmitted audio was good although it was necessary to talk closely to the inbuilt microphone to get adequate deviation.

Now to the VOX system. As mentioned before, it requires the use of the YH-2 head set. This consists of a single ear phone with head band and a light weight boom microphone attached to the single head phone. When plugged into the "mic" and "ear" sockets on the 203, the VOX system comes into action. Set the VOX switch at the rear of the 203 to the required VOX sensitivity and talk. The drop out delay time is fixed and appears to be a little under one second, so you will certainly need to practise operation before trying to make a contact on the local repeater. Transmitted audio quality was reported as being rather harsh with some distortion on sibilant sounds when using both the boom or inbuilt microphones.

The VOX control switch and the repeater off set switches on the rear are difficult to operate. Only a minute amount of toggle is above the back plate. Actuation is by sharp finger nail only. I can see that with a little use, the paint will soon be worn off the back plate.

The FT-203 receiver performance was rated on subjective tests as fair. On comparative tests the sensitivity was not as good as a couple of other transceivers available, although probably adequate in relation to the transmit performance. Probably the worst aspect of the receiver is the cross modulation. Again, if you only use an attached antenna you won't be troubled but with an external base station antenna you might be. I got considerable cross mod on the 146.650 and 146.750 repeaters when the Melbourne 146.70 repeater was on the air. On the other hand, the transmitter power was insufficient to access these repeaters.

Battery life as with all hand helds, depended on the amount of transmit time. The 203's 2.5 to 3.0 watts output is a little higher than some but of course the battery drain is also higher. I get the impression that most amateurs use their hand helds more for receiving than for transmitting anyway.

THE FT-203 INSTRUCTION BOOK

While most instruction books are getting worse, Yaesu's are getting better all the time. Two books are supplied with the 203, one very complete instruction, description and maintenance manual and a technical supplement with circuit board layouts and other technical data. Top marks Yaesu.

THE FT-203 CONCLUSIONS

This transceiver is highly recommended. It is a good performer in most respects. While the receiver performance leaves a little to be desired, it is on a par with many other hand held transceivers and I doubt that its shortcomings will worry many operators.

The VOX accessory is unique with this type of equipment and certainly interesting. I suggest you give it a try, you might like it, you might not.

Our thanks to Dick Smith Electronics, Head Office for the loan of the FT-203 used in our tests.

All enquiries should be directed to a Dick Smith store near to you.

EVALUATION AND ON AIR TEST OF THE YAESU FT-203R 2M FM TRANSCEIVER

Serial No 3N011790 — ***Rating code. Poor* Satisfactory** Very good*** Excellent*******

APPEARANCE

Packaging
**** Moulded foam container in carton.*

Size
**** Shirt pocket size.*

Weight
**** Only 450 grams.*

External finish
***** Beautifully finished.*

Construction quality
**** I didn't open it up, but appears very good.*

PANEL CONTROLS

Frequency selection
*** Thumb wheel switches. OK when you get used to them.*

Other controls
**** Knobs and push buttons of good size and feel.*

Rear panel switches
** Definitely need improving.*

RECEIVER OPERATION

Sensitivity
*** OK for a hand held.*

Signal handling
*** OK on helical antenna. Poor on external antenna.*

"S" Meter
**** Good to see one. Calibrated zero to ten only.*

Received audio
*** Rather sharp but intelligible.*

TRANSMIT OPERATION

Power output
**** Three watts and .3 watts.*

Transmit audio
*** OK but not 100 per cent clean.*

VOX operation
***** Great fun. Give it a try.*

Switching noise
***** All diode switched. Very smooth.*

Metering
**** "S" meter shows relative trans-output. LED shows Tx status.*

MANUAL

***** If only the others were half as good.*

AR

EQUIPMENT REVIEW

Ron Fisher VK3OM,
3 Fairview Avenue, Glen Waverley, Vic. 3150

THE LONG AND SHORT OF TWO METRE ANTENNAE FOR HAND HELDS

Just about every one who owns a two metre hand held transceiver wishes that he could put a better signal into the local repeater. A few hours listening on your local repeater will soon confirm that many HT operators really don't cut the mustard. The answer, or at least part of the answer is to put a better antenna on top.

As you have probably noticed serveral extended antennae are on the market at the moment which claim to give improved output when used in place of the normal flexie (rubber duck) antenna.

For the tests we carried out, the following antenna types were used:

1 Icom IC2A type helical
2 Vocom ⅝ wave telescopic antenna
3 Superstick ⅝ wave telescopic antenna
4 AEA ½ wave telescopic antenna
5 Superstick short helical antenna
6 ¼ wave whip antenna (home made)
7 All of the telescopic antennae in their retracted positions.

Before going into the results of our tests, it might be of interest to describe the methods used to evaluate the various antennae.

As the object of all the so called gain antennae is to produce a better signal, less noise or better quieting into the repeater, is seemed reasonable to assume that if the noise level from the repeater was measured on another receiver, any reduction in that noise would represent gain. While it could, of course, be argued that noise reduction in a receiver may not be linear in respect to an increase in signal, it seemed that this would, nevertheless, produce a figure of merit for the various antennae.

An audio VTVM was connected across the output of the normal home station two metre receiver. It was thus possible to measure down to about -60 dBm. The hand held transceiver AN IC-2A was operated in the low power position and all tests were done from the exact same spot which was selected to produce the greatest noise output from the local channel two repeater, while using the standard helical antenna. The various test antennae were then substituted for the helical and the resultant noise measured.

The results were as follows:

1 Standard Helical	*0 dB (reference)*
2 Short Super Stick Helical	*-.5 dB*
3 Vocom ⅝ telescopic	*+6 dB*
4 Super Stick ⅝ telescopic	*+3 dB*
5 AEA ½ wave telescopic	*+6 dB*
6 Super Stick set to ¼ wave	*+2 dB*
7 Vocom set to ¼ wave	*0 db*
8 AEA set to ¼ wave	*+.5 dB*
9 ¼ wave whip	*+2.5 dB*

Perhaps the greatest surprise in all of these tests was the relative performance of the short helical which was only .5 dB down on the standard helical and about half its length.

Both the ⅝ antennae were rather hard to handle and I would recommend that they be used outdoors and then with care. The Super Stick is about 1.4 metres long and the Vocom 1.22 metres which means you will need a home with high ceilings to use them inside.

The AEA half wave was shorter, just about 1 metre and also very much lighter and so somewhat easier to handle.

The best overall performer on the basis of size, cost and performance was the ¼ wave home made whip. All of the telescopic antennae worked to some extent in their telescoped positions but the only one to deliver any gain was the Super Stick. Considering their bulk, it is hardly worth using them in this state.

One interesting feature of the Super Stick is that it screws apart into three sections and it is claimed that a broken telescopic antenna section can be replaced. The BNC base section is also used with the short helical.

Over a long period of time, it might be interesting to see what effect the heavy ⅝ antennae have on the BNC connectors on hand held transceivers. I doubt that they were designed to take the weight of these antennae for long periods.

For additional information on the Vocom ⅝ antenna, refer to the review on this by Ron Cook VK3AFW in the April 1983 issue of AR.

My thanks to friends who loaned antennae for these tests. **AR**

EQUIPMENT REVIEW

Ron Cook VK3AFW
TECHNICAL EDITOR

THE BUTTERNUT SUPER-TROMBONE

Anyone who operates 2 m FM from their home sooner or later discovers the need for an antenna with a respectable amount of gain, particularily if they are using a standard quarterwave above a groundplane. A beam can be used but apart from the added expense of a rotator it can make net operation difficult if one or more of the stations fall in a null. The answer to these problems is an omni-directional vertical antenna with gain. This review describes an excellent candidate for this task.

The Butternut Electronics Co sell several antennae of interesting construction. One of these is the model 2MCV-5 'Super-Trombone'. This is the largest of their two metre antenna. It is effectively two ¼ wavelengths long and therefore should have a respectable 7 dB gain over a half wave vertical dipole. The patented 'trombone' phasing sections allow the radiator to remain unbroken by insulators and so retain high strength.

CONSTRUCTION

The base of the antenna is designed to slide over a 1⅛ inch mast or slide into a 1¼ inch OD mast. As the bottom of the antenna is a low impedance four radials are used. Matching is achieved with an adjustable gamma match. The radiator is thus kept at ground potential for DC. A phasing line made out of ⅛ inch aluminium rod is fitted half a wavelength up from the base. It is shaped like the slide in a trombone, hence the name. The task of the 'trombone' is to change the phase of the signal by 180 degrees so that maximum gain can be obtained by driving physically adjacent half waves in the appropriate phase. The 'super-trombone' uses two phasing sections. The main radiating element is made from four lengths of tubing ranging in diameter from ¾ inch down to ⅝ inch. The overall height is 15 feet 9 inches (4.8 m).

An SO-239 connector is provided for a 50 ohm coaxial feeder. The elements are made of aluminium and the clamps and assorted hardware are made of stainless steel. This should ensure minimal corrosion and long life in most locations.

PUTTING IT TOGETHER

The antenna is shipped in a box about four feet long and four inches square. The assembly of the antenna is quite rapid and the detailed instructions make the task an easy one. I took less than an hour to complete the assembly and most constructors would take no longer. Although it is probably quite obvious the instructions omit to say that both 'trombone' clamps use ¾ inch screws, the longer ones being reserved for clamping the main element's sections. Two flat nylon spreaders are used on each 'trombone' and these were a very tight fit on the main element. I found that a piece of timber eighteen inches long and three by four inches in cross section was needed to persuade the spreader to move. This was done by drilling a one inch diameter hole in the timber near one end. Once the spreader was fitted to the end of the element it could be drifted into position by placing the hole over the element and tapping the spreader sharply.

The only tools needed to assemble the antenna were a screwdriver and a small wrench.

TESTING

After the antenna was completed a check was made of the VSWR. This was found to be quite low across the whole band with the minimum occuring just below 145 MHz. As most FM operation takes between 145 and 148 MHz in VK a small adjustment was made to the gamma match as suggested in the instructions. This reduced the VSWR to 1.2:1 at 146 MHz instead of the initial 1.4:1. Some slight adjustments to the locations of the 'trombones' would have been necessary to improve the VSWR at 147 MHz. The table gives the VSWR after adjusting the matching.

TABLE 1

FREQ MHz	*VSWR*
144	*1.60*
145	*1.25*
146	*1.20*
147	*1.55*
148	*1.80*

On-air tests were made between 145 and 148 MHz using both simplex and repeater channels. A half-wave vertical mounted at thirty two feet was used as the reference. The test antenna was mounted at thirty five feet to reduce interaction. After completing one series of tests the coaxial cables to the two antennas were changed over and the tests repeated.

The perceived signal to noise ratio on signals through the more distant repeaters were compared. Tests were run at nominal 1 and 10 watt levels to check changes for 10 dB level changes. An attenuator was used to check the difference in level between the dipole and the 'super-trombone' by another station some ten miles distant.

Gains ranging from 5 to 6 dB were measured. The variations are attributed to the combined effects of receiver sensitivity variation, attenuator errors and changes in transmitter power with frequency, load and time. It therefore seems that the gain is close to the theoretical maximum of 7 dB.

Under normal conditions the dipole provides access to eight voice repeaters from my home QTH. The 'super-trombone' increased this to ten and improved the usefulness of four of the eight by giving noise-free signals. Further tests at a country location enabled operation through four repeaters instead of two with two more being improved from barely detectable to good copy although 10 watts was insufficient to reliably trigger these two repeaters. For these latter tests the reference antenna was a ⅝ vertical above a groundplane.

CONCLUSIONS

The 'super-trombone' is an excellent omni-directional vertically polarised antenna with a respectable amount of gain. It is well designed, being strong but lightweight and is easy to assemble (or dis-assemble). If you have a need for a high quality base antenna but have been put off by the problems of home construction, then this is the antenna for you.

The test antenna was kindly provided by Traeger Distributers NSW Pty Ltd. All enquiries should be directed to them.

AR

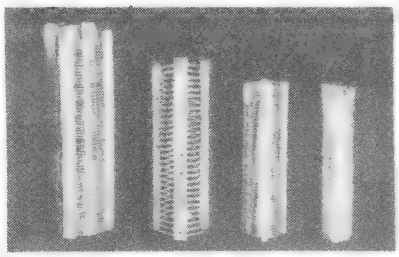
NEW RSGB PRESIDENT

Mrs Joan Heathershaw G4CHH was elected the 51st President of the RSGB on 11th August, 1984.

She will be the first YL president of the Society and will take office on 1st January, 1985.

AR

AIR-WOUND INDUCTANCES



No	Diam	Turns per Inch	Length	B & W Equiv	Price
1-08	½"	8	3"	No 3002	$1.60
1-16	½"	16	3"	No 3003	$1.60
2-08	⅝"	8	3"	No 3006	$1.90
2-16	⅝"	16	3"	No 3007	$1.90
3-08	¾"	8	3"	No 3010	$2.30
3-16	¾"	16	3"	No 3011	$2.30
4-08	1"	8	3"	No 3014	$2.60
4-16	1"	16	3"	No 3015	$2.60
5-08	1¼"	8	4"	No 3018	$2.90
5-16	1¼"	16	4"	No 3019	$2.90
8-10	2"	10	4"	No 3907	$4.20
8-10/7	2"	10	7"	No 3907	$7.20

Take the hard work out of Coil Winding — use "WILLIS" AIR-WOUND INDUCTANCES

WILLIAM WILLIS & Co. Pty. Ltd.

98 Canterbury Road, Canterbury, Vic. 3126
PHONE: 836 0707

JAMBOREE ON THE AIR PREPARATION

Ken McLachlan VK3AH,
PO Box 39, Mooroolbark, Vic. 3138

The opportunity could not be missed of capturing a photograph of the action, when the West Nunawading (Victoria) "JOTAings" were preparing for their participation in JOTA 1984, using the call VK3SDG, which was held over the weekend of the 20th and 21st of October.

The Nunawading District JOTA co-ordinators Ron Welsh and John Brown VK3NYE, prepared and distributed, well in advance of the event, an excellent four page circular to all the surrounding area leaders to ensure that maximum participation of "on air" time would be used over this important weekend of the year.

During JOTA, cubs and brownies to guides and rangers can participate and make new friends within Australia and overseas, develop an interest in different scout badges and have an excellent introduction to the hobby of amateur radio. Also it is a time when Scout and Guide Leaders, can meet, describe their group, the activities they engage in and introduce their troop and unit with pride.

Ron and John followed the initial circular with two thousand copies of a two page "Newsletter" that was distributed to every uniformed guide and scout in the area, three weeks prior to the JOTA weekend, advising of the events that visitors may take part in.

JOTA is one of the best Public Relations exercises in which an individual amateur can exhibit the versatility and scope of his or her hobby, whether it be in a home, hall or portable location, to the participants, parents and the public at large, generally through the local press.

AR

Team effort — Amateur Radio and the Canadian Police

This account is to put on record the group effort carried out on Monday 13th February 1984 to track down Clark Bremner, the son of our friend Tom who had collapsed and died at a church working bee on the previous Saturday. Clark was travelling in Eastern Canada and was active with a group called "Youth with a Mission." His family attempted to contact him by phone at his last known address in the city of Cambridge, Ontario. The call was taken by an answering service which would not be checked until after the weekend — remember Ontario is 15 hours behind Sydney time.

On Monday at 8 AM a train of communications was set in motion via amateur radio to try to locate Clark. An amateur radio friend in Balgowlah known to have regular contacts into Ontario was briefed (Harry VK2DA) and a search for Canadian amateurs commenced. Two others joined in the search, Ron VK5ON in Adelaide and Ray VK2RB in Clontarf. By 8.30 AM we had contacted four Ontarian amateurs VE3HGZ (Rocco) VE3HGN (Don) VE3HC (Fred) and (Al) VE3AS in Paris, Ontario. Al was able to receive Harry very well and took the message and agreed to relay it. Paris was about 100 miles from Cambridge, however he was able to contact Fred VE3AAI on the Cambridge 2 metre repeater who in turn took over. Fred rang the phone number and received the same frustrating reply. He decided that the Ontarian Police was the next step to take.

The details from then on are not so well known, however Al VE3AS subsequently reported that the Ontarian Police handed it on to the Novia Scotian Police and they in turn to the New Brunswick Police. The latter tracked Clark down in the town of Saint John. At 2 PM that afternoon Sydney time Clark phoned his mother Joan, five hours after the initial action started. Surely a good team effort!

The following morning Al and Don were on the air again and we were able to convey our grateful thanks to them that the "mission was accomplished." Clark subsequently rang his mother a couple of times and comforted her from afar.

As a point of interest for the uninitiated the path over which the amateur signals passed from Sydney to Ontario was on the great circle "dark route" via the southern Indian Ocean, South Africa, southern and northern Atlantic Oceans ie WSW from Sydney a surface distance of about 24 000 kilometres. The 20 metre amateur band was used for these contacts.

Arthur Brown, VK2IK

AR

NEW VK4 YL

Many will remember Joyce H44KR and her adventures on the Chinese junk, along with her husband Stoney. Then, of course, they were almost shipwrecked when voyaging down to Cairns a couple of years or so ago.

Joyce obtained a full call on their arrival on a reciprocal basis, but was downgraded to a Novice call sign.

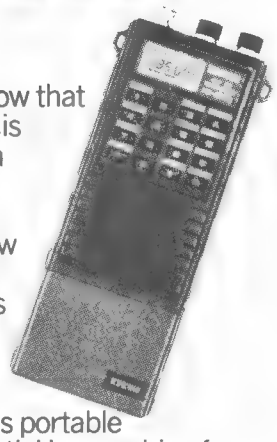
Some five months ago Joyce and Stoney had to return to their home in the States, and whilst there Joyce obtained a full US call. She was issued with the call sign VK4BBB on her return to VK land and no doubt we shall be hearing her very pleasant voice again, and lots of us will certainly enjoy her company.

Contribution and photograph Ray Robinson VK4ACU.

AR

Joyce and OM Stoney

THE WORLD CLASS UHF HAND HELD



Did you know that ICOM build this hand-held in a sealed case? With squelch sensitive below 0.1μV, and over 2.5 watts output, the processor controlled features of this portable become essential in searching for that elusive QSO. Priority scan in selectable increments and 10 memories are just a few features that fit comfortably into your hand. UHF opens a whole new experience for you, the IC-04A is built to help.

ICOM
The World System
Look for the Dealer list in this magazine or phone ICOM on (03) 51 2284
ICO01

AR SHOWCASE

NEW LOW COST FUNCTION GENERATOR

Parameters have released a new versatile signal generator that provides all the major functions of a standard generator plus a complete sweep generator capability.

Designated the TFG-4613 and manufactured by Topward Electric, the new generator can produce sine, square, triangle, ±Ramp, ±pulse, AM, FM, sweep Trigger Gate and burst waveforms over eight frequency ranges from 0.1 Hz to 13 MHz. Amplitude modulation frequency range is 0.01 Hz to 10 kHz to a depth of 100%. With an external source this range is extended to DC to 1 MHz. Frequency modulation can be applied to the main waveform to ±5% over a frequency range from 0.01 Hz to 10 kHz and, once again, this may be extended to DC to 50 kHz with an external source.

Frequency accuracy of the primary waveform is ±5% of full scale and distortion is less than 0.5% THD from 10 kHz to 50 kHz. Output is continuously variable from 1 mV P-P to 20 V P-P into an open circuit.

Sweep generator range is 100:1 on any range. The sweep is linear between start and stop frequencies set by the user. Sweep rate is variable from 0.01 Hz to 10 kHz.

The output frequency of the TFG-4613 may be varied by the application of an external voltage over a 1000:1 range. The frequency verses voltage curve is linear with 0.5% over a 100:1 frequency range.

For further information please contact: Parameters Pty Ltd, PO Box 573, Artarmon, NSW, 2064. Telephone: (02) 439 3288.

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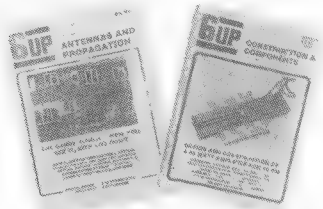

6 UP MAGAZINE

This is an interesting magazine for the radio enthusiast.

The Autumn 1984 edition features "Antennas and Propagation" as its main theme. Incorporated into this theme are Meteor Scatter Propagation, Getting Started on 432, Loop Yagi Antenna, Getting Amongst Auroral Scatter, and more.

Winter edition is a construction and components issue for those interested in the VHF/UHF bands — 6 m and up. There is design and construction details for a 45 watt, 70 cm Amplifier, Microstrip Information, Satellite Report, etc.

By subscription 6 UP is available for $15 per year (four issues).

Further information may be attained from the Printer/Publisher — Teknidata Services Pty Ltd, Box 844, North Sydney, NSW 2060.

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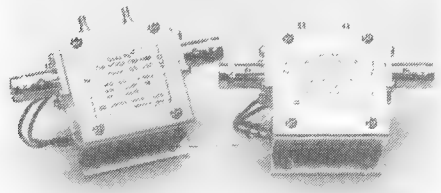

VLF CONVERTER

Many current communications receivers have limited coverage or poor sensitivity below 500 kHZ, a region which includes time signal transmissions, beacons, long wave broadcasting, and certain communications and navigational services.

By connecting the Datong Model VLF in series with a receiver's antenna, incoming VLF signals are converted to a frequency 28 MHz higher and can be received at high sensitivity with no modifications being required to the receiver.

For example, to receive signals at 19 kHz the receiver would be tuned to 28.019 MHz. Similarly tuning the receiver to 28.200 MHz would give reception of signals at 200 kHz.

Although the main application of Model VLF is to signals below 500 kHz, it can also be used to give reception of long and medium wave signals on normal amateur-bands-only receivers. An internal low-pass filter progressively attenuates signals above 600 kHz, but the sensitivity is still adequate to allow good reception of medium and long wave broadcast stations for time checks, news bulletins, etc.

For further information contact EMTRONICS, 92-94 Wentworth Avenue, Sydney, NSW, 2000. Phone (02) 211 0988.

AR

PREAMPLIFIER

The GS-430, GS-144 GaASFET preamplifiers were originally designed for SHF band communication equipment but are now attracting wide attention as receiving devices on the UHF band.

One of the remarkable features of the GaAS is its higher gain and lower noise than a MosFET.

The Corona GS series are the first products on the market to realise high performance and low price utilising high grade GaASFET and Q trimmer.

The 70 cm unit sells for $89 whilst the 2 m one is $79.

Further information may be obtained from Dick Smith Electronics Stores and Agencies.

AR

DIGIT FULLY PROTECTED MULTIMETER

The new Topward TDM-104 Multimeter is a combination bench/field unit featuring high accuracy and full overload protection on every range.

Twenty eight ranges combine with a basic DC accuracy of 0.1% ± one digit and three and a half digit resolution to provide a very comprehensive capability. Input impedance is around 1000 Mohms and the unit will tolerate common mode voltages up to 1400 V peak. A 20 A current range is provided for the direct measurement of relatively high currents.

Measuring 233 mm x 80 mm x 300 mm and weighing a mere 1.4 kg, the TDM-104 is ideal for a wide range of laboratory or field applications. The carrying handle is lockable in a number of positions to provide a tilt stand capability.

For further information please contact: Parameters Pty Ltd, PO Box 573, Artarmon, NSW, 2064. Telephone: (02) 439 3288.

AR

NEW 120 MHz FREQUENCY COUNTER

A new frequency counter released by Parameters Pty Ltd features low cost and a wide frequency range extending from 10 Hz to 120 MHz.

The new unit, designated the TFC-122 and manufactured by Topward Electric, can handle signals down to 20 mVRMS and can cater for inputs right up to 200 VRMS.

A nine digit red LED display provides a bright, clear indication with a resolution of either 0.1 Hz, 1 Hz or 10 Hz. Temperature stability is $\pm 3 \times 10^{-5}$ and its aging rate is better than 1×10^{-6} per month.

Measuring only 233 mm x 80 mm x 300 mm the new instrument is ideal for either laboratory or field use in a wide range of communications engineering and testing applications.

For further information please contact: Parameters Pty Ltd, PO Box 573, Artarmon, NSW, 2064. Telephone: (02) 439 3288.

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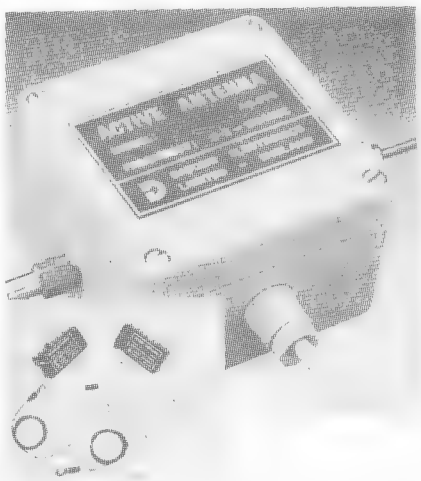

ACTIVE RECEIVING ANTENNAS

The new Datong receiving antennas are ultra-compact receiving antenna systems giving wideband coverage from 200 kHz to 30 MHz at high sensitivity.

Models AD270 and AD370 give similar receive performance to large conventional antenna systems yet are only three metres in overall length. The balanced dipole configuration also gives good rejection of local interference.

Features included are: available in two versions: one for indoor use only (Model 270), the other for outdoor mounting (Model 370), overall length only three metres yet gives signal-to-noise ratios comparable to full size conventional antennas in the 200 kHZ to 30 MHz range, the response is broadband and no tuning or adjustment is required when changing frequency, therefore ideal for mounting in remote positions, eg: loft, attic, roof or chimney, designed to professional standards of low noise level and strong signal performance, dipole configuration gives choice of polarisation plus useful directivity and eliminates need for ground plane or earth connection, excellent balance and constant output impedance minimise interference pick-up by the feeder and no need for expensive accessories such as antenna tuner units or matching units.

Further information may be obtained from EMTRONICS, 92-94 Wentworth Avenue, Sydney, NSW, 2000. Phone (02) 211 0988.

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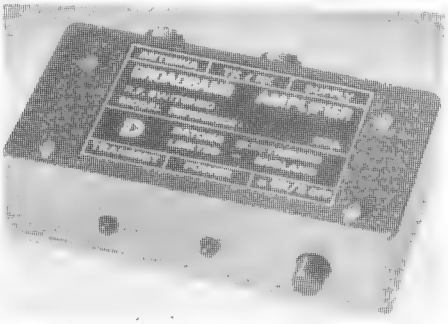

BROADBAND PREAMPLIFIER

The Datong Model RFA will improve the weak signal sensitivity of most existing receivers and transceivers in the frequency range from 5 to 200 MHz.

The gain of Model RFA is deliberately fixed at a value which gives the desired sensitivity improvement without, at the same time, overloading the receiver with overamplified unwanted signals on other channels. It is important to realise that the use of excessive gain in a preamplifier can often reduce signal-to-noise ratio instead of increasing it. This is because the many unwanted signals which are nearly always present combine together to produce intermodulation products in the overloaded receiver circuitry. These products appear as large numbers of phantom signals or in severe cases as a general increase in background noise level which easily masks any improvement in signal-to-noise ratio for single weak signals.

Model RFA minimises these effects by (a) having a very low internal noise level, (b) keeping the gain at a suitable value, (c) having such a high overload level that it's contribution to intermodulation is negligible compared to that of the receiver.

Further information on the Datong Broadband Preamplifier may be obtained from EMTRONICS, 92-94 Wentworth Avenue, Sydney, NSW, 2000. Phone (02) 211 0988.

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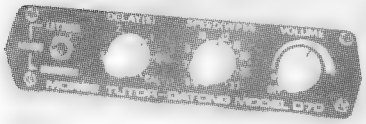

MORSE TUTOR

The revolutionary new way to practice Morse code reception. An unlimited supply of precision Morse at the turn of a switch, plus a built-in oscillator for sending practice

The Datong Morse Tutor sends a continuous stream of precision Morse code in random five letter groups. Its sending is impeccable; it never repeats and it never tires

You can select letters only, numbers only, or letters and numbers mixed, at the flick of a switch.

Best of all not only can you vary the basic sending speed from 6.5 to 37 words per minute, you can also increase the delay between letters from the "correct" value (three dot periods) to a maximum of over three seconds.

This delay facility means that right from the start you can learn each letter and number as it ought to be learnt, that is with the dots and dashes within a letter fast enough to form a complete sound pattern, but with a long delay between each letter. As you improve you simply reduce the delay between letters.

Skill at Morse reception only comes with practice and this uses up valuable leisure time. With Model D70 you can make every minute count because you can tailor the level of difficulty exactly to your own ability.

Priced at $159 the Datong Morse Tutor is available from EMTRONICS, 92-94 Wentworth Avenue, Sydney, NSW, 2000. Phone (02) 211 0988.

AUTOMATIC WOODPECKER BLANKER

All too often in the past the sudden appearance of the "Woodpecker" has wiped out that elusive DX, or ruined a good QSO Now for the first time there is a really effective antidote, and at a highly competitive price — $199.

With Datong Model SRB2 fitted in series with the antenna and loudspeaker of your receiver or transceiver everything is the same until the Woodpecker appears. When it does, the internal circuitry quickly analyses the details of the Woodpecker's pulses and generates blanking signals to remove them from the receiver.

The process is automatic and fast. Only two or three seconds of the wanted signal are lost during the "analysis" time. After that the signal you want is "in the clear" again.

No matter how paralysing the strength of the Woodpecker, you will be able to copy through it. And with hardly any desensitising of the receiver thanks to our exclusive double blanking technique.

Further information may be obtained from EMTRONICS, 92-94 Wentworth Avenue, Sydney, NSW, 2000. Phone (02) 211 0988.

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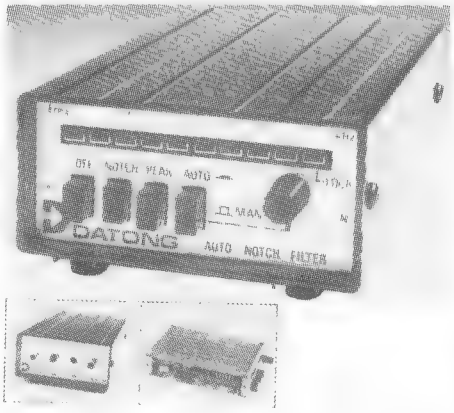

AUTOMATIC AUDIO NOTCH FILTER PLUS CW FILTER

As the HF communication bands become more and more congested there is an increasing need for counter measures over and above the facilities built into current transceivers.

The Datong Model ANF is designed specifically to solve the problem of unwanted heterodyne whistles. In addition it performs as an effective CW filter. Features include:

- Removes tune-up whistles or other heterodynes automatically.
- 10 LED bar-graph type display of audio notch frequency shows search-and-lock mode in action.
- Built-in fully tunable 4 pole CW filter.
- Connects in series with speaker on any receiver.
- Built to professional quality standards.

For further information contact EMTRONICS, 92-94 Wentworth Avenue, Sydney, NSW, 2000. Phone (02) 211 0988.

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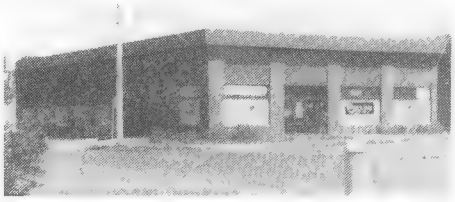


LARGER PREMISES

Recently Ian J Truscott Electronics moved to the corner of Lacey Street and Windsor Road in Croydon, Vic.

Ian's new premises are much larger but he is still providing the same courteous service.

Ian J Truscott Electronics are also agents for Dick Smith Electronics.

THE WORLD CLASS COMPACT MOBILE

When the engineers at ICOM designed the IC-47A, they knew you would have almost no room to mount it. Take a good look at the dashboard in your car. ICOM have packed a processor controlled, 25 watt UHF mobile into just 58 cubic inches. Think about it, your IC-22S is 87 cubic inches and it doesn't rank in the same class. The 47A offers 32 CTCSS frequencies, scanning, memories, even a speech synthesizer to aid blind operators.

ICOM
The World System
Look for the Dealer list in this magazine or phone ICOM on (03) 51 2284
IC 003

RTTY PICTURES COMPETITION

RTTY picture courtesy Steve VK2BGL.

An international RTTY Art Competition is being run by the Wireless Institute as part of the WIA 75th Anniversary Celebrations.

Entries must be printable using a Siemens model 100 teleprinter, and must not contain more than three overlinings.

A hard copy and Baudot tape has to be supplied with each entry — all entries will be acknowledged in Amateur Radio magazine.

Help spread the word about this competition — particularly if you operate RTTY on the DX bands.

CATEGORIES

(a) Best hand generated original submitted by its author outside VK.

(b) Best hand generated original submitted by its author who is a VK.

(c) Best non-original hand generated or computer generated RTTY picture.

Entries closed 31 August 1985 and must be sent to: *WIA 75 RTTY Art Competition, Wireless Institute of Australia, 412 Brunswick Street, Fitzroy, Victoria, Australia 3065.*

OCTOBER BEST PHOTOGRAPH

The judges selected the photograph of Don Burns on page 7 as the best photograph for October.

BEACON CHANGES

Please note the following changes to the VHF Beacons located in Perth.

VK6RTV on 52.300 MHz is now VK6RPH.

VK6RTV on 145.000 MHz is now VK6RPH.

Two additional beacons located in Perth are to be added to the list, one on 432 MHz and one on 1.2 GHz. The 432 MHz beacon is VK6RPR on 432.140 MHz, the 1.2 GHz beacon also with callsign VK6RPR will be located on 1296.42 MHz.

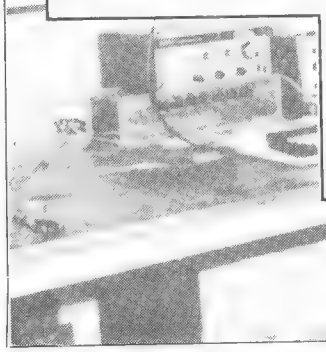
Bruce Williams VK6CX
Secretary West Australian VHF Group (INC)

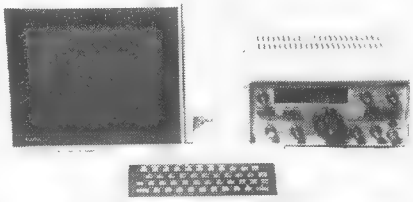
Radioteletype special: Electronics Today, November!

COMPUTER-DRIVEN RTTY TRANSCEIVER
Designed to plug into the parallel port of the popular Microbee, but adaptable to other computers sporting an 8-bit port, this project is an 'all-singing, all-dancing' RTTY modem. Based on the older, and very popular, ETI-730 and ETI-731 RTTY projects from 1979, revised and updated, the project features LED bargraph tuning displays, variable shift control, split-screen operation, hard copy output to a printer, message buffers, etc, etc. Great for weak signal work on HF or VHF.

'GLASS TELETYPE' USING THE VZ200
Dick Smith's popular and cheap home computer, the VZ200, makes an ideal basis for a 'glass RTTY terminal'. This project simply plugs into the expansion port and comes with software in ROM. It features split-screen operation, message buffers, printer output routines, etc. It's simple to build and will get you on the air with computerised RTTY with the minimum of fuss. Can also be converted for receive-only use for copying the commercial RTTY signals on the HF bands.

UPDATE ON THE ETI-733 RTTY DECODER
Tom Moffat, VK7TM, has written a short piece on updating this very popular project, including software enhancements, tips on reducng receiver interference from the computer, etc.





DON'T MISS THIS EXCITING ISSUE! ON SALE AT YOUR NEWSAGENT, ONLY $2.50

FISHER'S GHOST AMATEUR RADIO CLUB

The Fisher's Ghost ARC was formed in January 1983 (see page 36, May *AR*)and now has fifty seven members.

The Club is situated in Campbelltown NSW and recently members of the Club have been meeting regularly with members of the amateur radio club in Koshigaya, Japan.

Campbelltown and Koshigaya are sister cities and amateur radio is spanning the kilometres promoting goodwill. Scheds are arranged for each Sunday morning on 21.180 MHz ± 10 kHz at 2200 UTC and regular contacts have been made between VK2KFV and JA1WEK.

Contributed by Arthur Harris VK2KFV

AR

GOLD COAST AMATEUR RADIO SOCIETY

The 7th Annual Gold Coast Amateur Radio Society Hamfest will be held on Saturday, 10th November, 1984 and once again the venue will be the Albert Waterways Community Centre at Broadbeach, in the heart of the Gold Coast.

This is now one of the major events on Australia's Amateur Calendar, and attracts visitors from all over Queensland and from interstate.

There will be the usual Trade Displays, Demonstrations of all facets of amateur radio, stalls, and items of interest for the ladies. A feature this year will be a Club Station operated by YL Licence Holders who will be available for operators desiring The Gold Coast Award, and who will be taking part in The Alara Contest of that weekend.

The Society invites all amateurs to contact the Club Station on that day to gain The Gold Coast Award. The Club call is VK4WIG.

AR

HAMVENTION '84

The Ballarat Amateur Radio Group will be conducting the 1984 "Hamvention" during the weekend of 10th and 11th November 1984.

The venue will be the Sebastopol Football Club rooms located at the Marty Busch recreation reserve 7 km south of the Ballarat Town Hall on the Ballarat-Colac Road.

There will be a dinner on the Saturday night beginning at 7 pm at a cost of $11.00 per head. Free refreshments will be served from 6-7 pm with full bar service available during the evening.

The guest speaker will be Mr Ian Gordon, well known Ballarat solicitor who will speak on humour and the courtroom.

The Sunday venue will also be the recreation reserve. A full range of amateur radio events will begin at 9.30 am with other events for ladies and children during the day. A BBQ lunch and afternoon tea will be provided at a cost of $7.00 per head. (Children under 12 free.) A mystery bus tour has been arranged for non competitors during the afternoon.

Talk-in facilities will be provided on repeater VK3RBA (146.750 MHz input) and also on 3.610 MHz SSB.

Everyone welcome.

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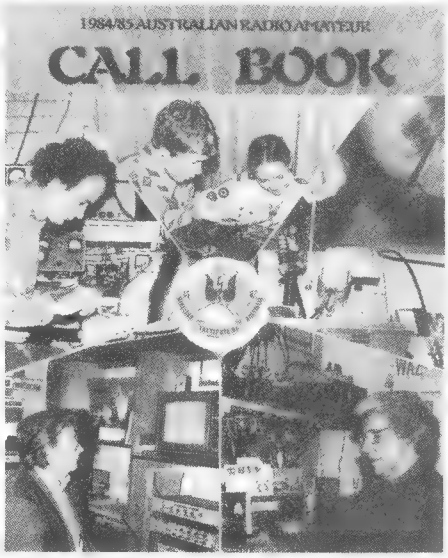


A limited number of 1984/85 Call Books are still available from WIA Divisional Offices.

ORDER YOURS NOW

CALL BOOK CORRECTION

The Department of Communications attention has recently been drawn to a serious typographical error which has occurred in the licensing information detailed on page 120 of the 1984-85 Call Book. Unfortunately, it would appear that somewhere during the publishing process, the emission modes F2A/G2A have been inadvertently inserted into the list of permissible emissions applicable to ALOCP licensees. As all will be aware, ALOCP licensees are not authorised to utilise these emission modes (aural telegraphy), consequently the AACB information is misleading.

Also an amendment for various awards available from the Gold Coast Amateur Radio Society. The Post Box for these awards is Box 588

The address of VK2ZAB has mistakenly been deleted from the current Call Book.

It should read:

VK2ZAB G Mcdonald, 59 Wideview Road, Berowa Heights, NSW, 2082.

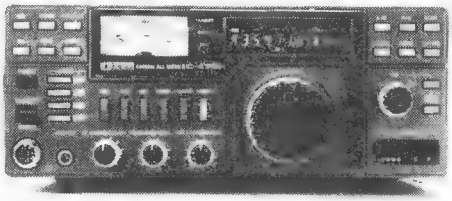
Any errors detected in the Callsign Listings of the 1984/85 Call Book should be notified to the Federal Office in writing **IMMEDIATELY** so that they may be amended.

As callsigns alter so frequently — with a minimum time lapse between holders in some instances — it is beneficial to all amateurs to take time out to check the Call Book to ensure their information is correct.

It would also be beneficial for members wanting their addresses suppressed from the next Call Book to re-submit their request.

For all amendments and corrections write to: The Federal Secretary, Box 300, Caulfield South, Vic 3162.

THE WORLD CLASS UHF BASE STATION



An amazing 75 watts at 430 MHz. Think of it, Moonbounce DX at UHF? ICOM's 471H provides you with the opportunity of controlling one of the most advanced base stations of its kind. VOX, all modes, noise blanker, RF pre-amp and much more.
A 25 watt model is also available, IC-471A.

ICOM
The World System
Look for the Dealer list in this magazine or phone ICOM on (03)51 2284
ICO05

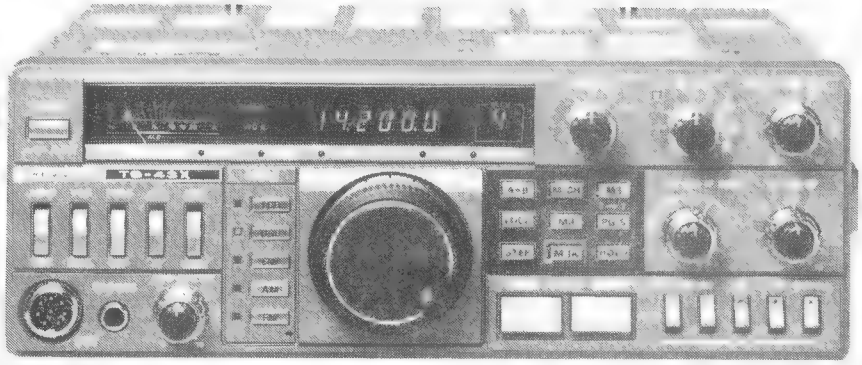
KENWOOD

'84 SUMMER SIZZLER SALE

HF TRANSCEIVERS

$1075

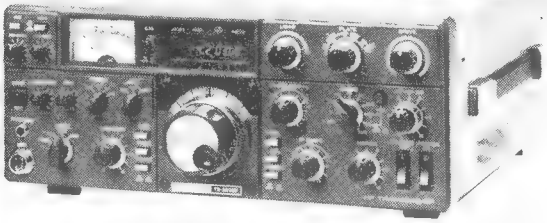
SAVE $87



TS-43X HF TRANSCEIVER
Complete with MB-430 and FM-430
The most versatile transceiver of the 80's.

SAVE $185

$950



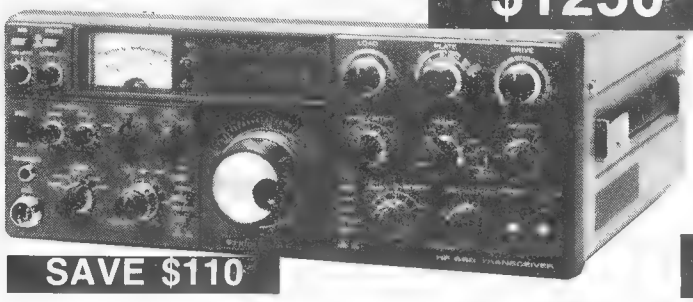
TS-530SP HF TRANSCEIVER
Complete with VFO-240
With notch filter and built-in AC Power Supply.

$1699

SAVE $486

TS-93X MARK II HF TRANSCEIVER
The ultimate in all HF transceivers.

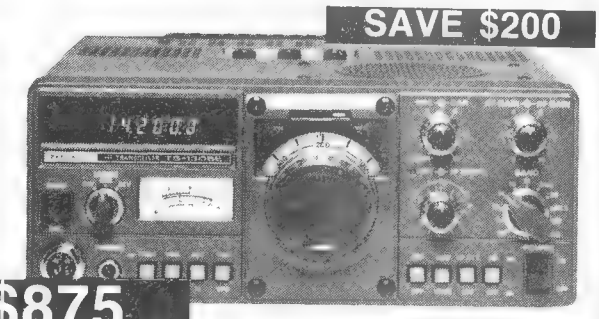
$1250



SAVE $110

TS-830S HF TRANSCEIVER
Complete with KB-1 Spinner Knob and a spare set of valves.

SAVE $200

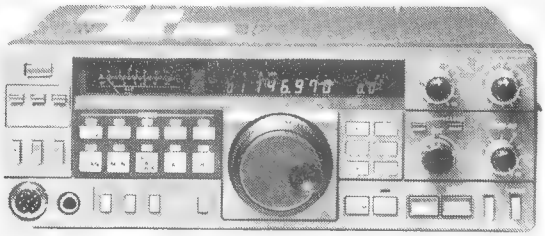


$875

TS-130SE HF TRANSCEIVER
Complete with DFC-230
Mobile or fixed operation – 100 watts.

KENWOOD

VHF TRANSCEIVERS



$999

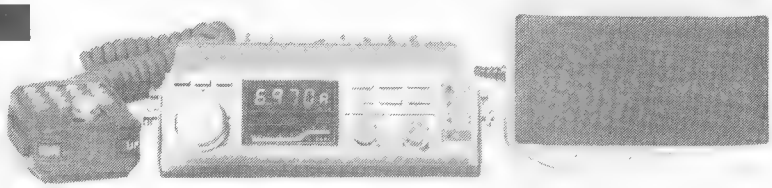
SAVE $65

TS-711A 2M ALL-MODE TRANSCEIVER
Complete with SW-100A SWR Meter.
Has new (DCS) Digital Code Squelch system – Multi-mode Base station.

TR-2600A
2M FM
HAND HELD
TRANSCEIVER
Complete with SC-4.
Has new DCS system.

$399

SAVE $29

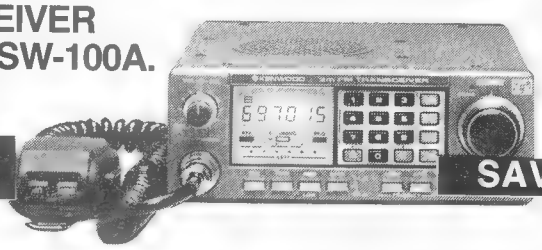


$499

SAVE $65

TM-211A 2M FM MOBILE TRANSCEIVER
Complete with SW-100A SWR Meter.
Has new Digital Code Squelch system (DCS) – 25W Output.

TR-795O 2M FM TRANSCEIVER
Complete with SP-50 and SW-100A.
Big 50 watts output – 20 memories.



$550

SAVE $95

$299

SAVE $16

SAVE $49

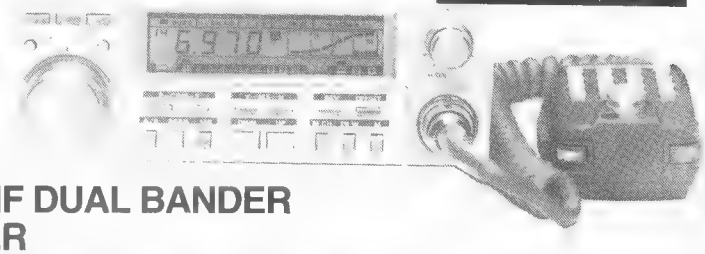
TR-913O 2M ALL-MODE TRANSCEIVER
Powerful compact multi-mode mobile – 25W output.

$650

$772

SAVE $59

TH-21A
2M FM
POCKET
TRANSCEIVER
Complete with Soft Case.
Ultra small.



TW-4000A VHF/UHF DUAL BANDER
25W TRANSCEIVER
Complete with MA-4000 Dual band mobile antenna.

KENWOOD

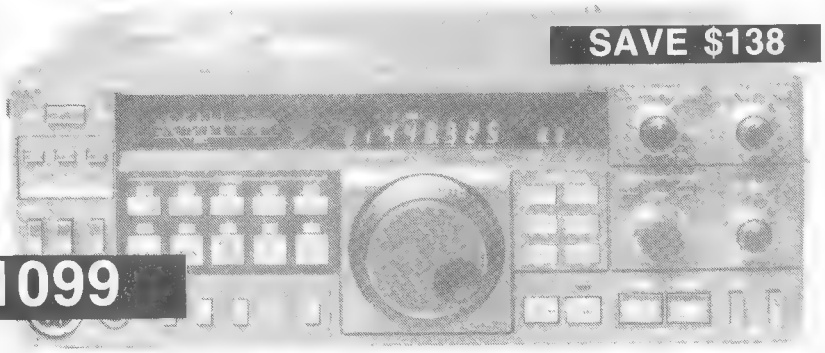
UHF TRANSCEIVERS

TR-3600A 70CM FM HAND HELD TRANSCEIVER Complete with Soft Cover.

$399

SAVE $29

SAVE $138



$1099

TS-811A 70 CM ALL-MODE TRANSCEIVER Complete with SW-200B SWR Meter.

$499

SAVE $65

TM-411 70CM FM MOBILE TRANSCEIVER Complete with SW-100B SWR Meter.

TH-41A 70CM FM POCKET TRANSCEIVER Complete with Soft Cover.

$299

SAVE $16

All items on the first 5 pages are available from stock at the time of preparing this advertisement. All items are only available from 1.11.84 to 31.1.85 or until stocks are sold.
Naturally, should a change in duty, sales tax or devaluation occur, these charges must be reflected in final pricing.
All prices exclude freight charges and an allowance must be made to cover these extra costs.

TRIO-KENWOOD (AUSTRALIA) PTY. LTD.

(INCORPORATED IN N.S.W.)
4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066.
Ph. (02) 428 1455.

Further, beware of dealers not listed in this advertisement who are selling Trio-Kenwood communications equipment. All Kenwood products offered by them are not supplied by Trio-Kenwood (Aust.) Pty. Ltd. and have no guarantee applicable

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WASSIL ELECTRICAL — 71 SUMMER STREET, ORANGE (063) 62 6249
STOCKMAN & HIGGINS — BYRON STREET, INVERELL (067) 22 1300
ELECTRON 2000 — 3 ELIZABETH STREET, TIGHES HILL, NEWCASTLE (049) 69 6399
MACELEC PTY. LTD. — 99 KENNY STREET, WOLLONGONG (042) 29 1455
E&K COMMUNICATIONS — 14 DUTTON STREET, DICKSON A.C.T. (062) 49 6437
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LAND LINK — MULLALEY ROAD, GUNNEDAH (067) 42 2838
LAND LINK — 61 BARNES STREET, TAMWORTH (067) 65 4622
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PARAMETERS PTY. LTD – 53 GOVERNOR ROAD, MORDIALLOC (03) 580 7444
BRIAN STARES – 11 MALMSBURY STREET, BALLARAT (053) 39 2808
SUMNER ELECTRONICS – 78 KING STREET, BENDIGO (054) 43 1977
TAS: HOBBY ELECTRONICS — 477 NELSON ROAD, MT. NELSON (002) 23 6751
GELSTON ELECTRONICS — SUMMER HILL (003) 27 2256
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MARINE & COMMUNICATION — 19 CHARLES STREET, LAUNCESTON (003) 31 2711
V.K. ELECTRONICS — 214 MOUNT STREET, BURNIE (004) 31 7733
QLD: MITCHELL RADIO CO — 59 ALBION ROAD, ALBION (07) 57 6830
S.A. & N.T.: INTERNATIONAL COMMUNICATIONS SYSTEMS PTY. LTD — 8 NILE ST., PORT ADELAIDE (08) 47 3688
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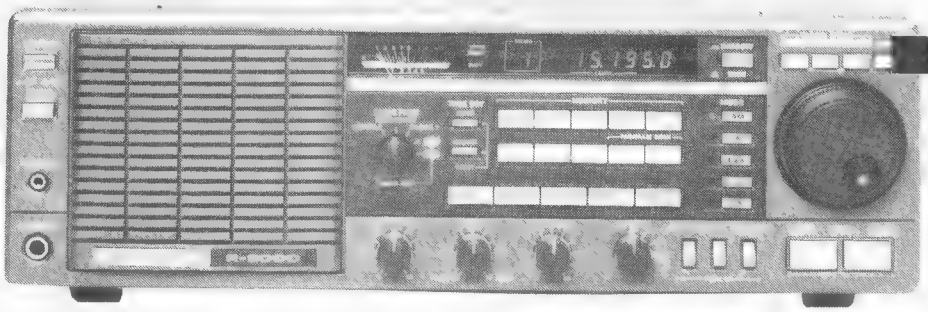
KENWOOD

RECEIVERS

R-2000 COMMUNICATIONS RECEIVER
World's leading all mode receiver.
Receives 150 kHz to 30 MHz.
Includes HS-6 and DC Conversion kit.

$699



SAVE $46

The R-2000 is an innovative all-mode SSB, CW, AM, FM receiver that covers 150kHz - 30 MHz. New microprocessor controlled operating features and an "UP" conversion PLL circuit assure maximum flexibility and ease of operation. Key features include digital VFO's, ten memories that store frequency, band and mode information, memory scan, programmable band scan, digital display and 24 hour dual clock with timer, plus a host of other features to enhance the excitement of listening to stations around the world.

$899

Receives
150 kHz to 30 MHz
50 MHz to 54 MHz

Note: 8.7 to 8.95 MHz is not receivable due to technical design.

TS-670 ALL-MODE "QUAD BANDER" TRANSCEIVER
Includes GC-10 General Coverage Receiver and VS-1 Voice Synthesizer.

The TS-670 "Quad-Bander" is a unique all-mode transceiver that covers the 6 meter VHF band, and the 10, 15, and 40 meter HF bands, combining the ultimate in compact size with advanced circuit design and performance. Key features include dual digital VFO's, 80 memory channels, memory scan, programmable band scan, frequency direct key selection, a two-color fluorescent tube display with function indicator LED's, IF shift, and squelch. This unit is ideal for the hard to see as the voice synthesizer announces the frequency when the VOICE switch is depressed. The TS-670 operates on 13.8V at 1.1A on RX or 4.2A on TX/RX.

KENWOOD

ACCESSORIES

SAVE $26

$140

CD-10 CALL SIGN DISPLAY
Introductory offer.

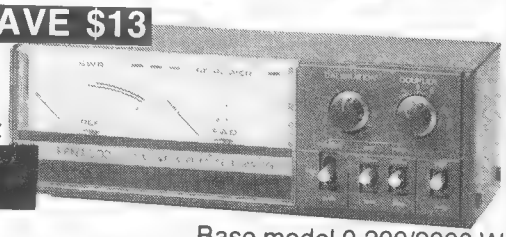
SAVE $5

SW-100 A/B
Mobile model 0-150 W.
Model (A) 1.8-150 MHz
Model (B) 140-450 MHz

$60

SAVE $13

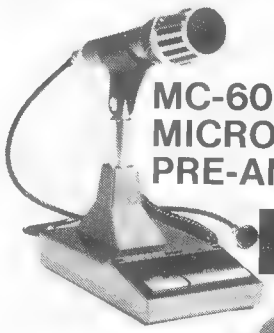
SW-200 A/B
Base model 0-200 W.
Model (A) 1.8-150 MHz
Model (B) 140-450 MHz



$125

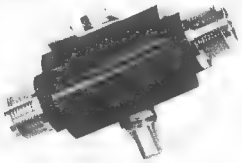
SW-2000 Base model 0-200/2000 W 1.8-54 MHz

$140 SAVE $19



MC-60A DELUXE DESK TOP MICROPHONE WITH BUILT-IN PRE-AMPLIFIER (500Ω/900Ω) (8 PIN)

$100 SAVE $12



AL-1 LIGHTNING ARRESTER
with SO-239 connector.
Handles 100 W output at 50Ω

$35

SAVE $7

MC-80 DESK TOP UP/DOWN MICROPHONE (8 PIN)
Unidirectional electret condenser mic.

$60

SAVE $9

AL-2 LIGHTNING ARRESTER
with SO-239 connector.
Handles 1 kW output at 50Ω

$38

SAVE $10

MC-85 DESK TOP MICROPHONE
Includes two additional outleads with any configuration you require

$130

SAVE $35

$50 SAVE $9

MA-4000 MOBILE ANTENNA 2M & 70 CM DUAL BAND

SAVE $13

DM-81 DIP METER

THE DM-81 dip meter is intended for adjustment of radio equipment and antennas.
It is self-excited oscillator designed for external coupling to the equipment being tested.

$130

FEATURES

- Measurable frequency range of 700 kHz-250 MHz in seven bands
- Capacitive probe for measurements without removing coil shields
- Storage compartment for all seven dip meter coils, capacitive probe, earphone and ground clip lead
- Convenient for both indoor and outdoor measurements, all solid-state and built-in battery.

KENWOOD

SUPER SANTA SPECIALS

- ★ STRICTLY LIMITED OFFER
- ★ ONLY WHILE STOCKS LAST
- ★ FIRST COME – FIRST SERVED
- ★ PLEASE ALLOW FOR FREIGHT EXTRA ON ALL ITEMS

SPECIALS shown on this page are ONLY available from the Head Office of TRIO-KENWOOD and will NOT be supplied from any of our dealer network.

TK-137

$390

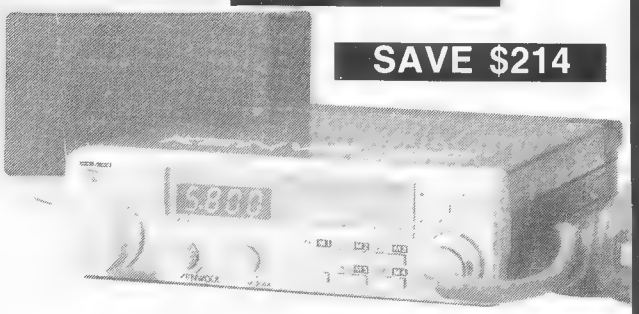
7 ELEMENT LOG PERIODIC

SAVE $140

TK-137. Frequency range 13 MHz to 30 MHz continuous. Boom length 7.3 metres — Weight 18 kg. — Twin Radio 6.5 M — 2 Kw Balun included — Average gain 9.5 dB.

PLUS FREIGHT

$340



SAVE $214

TM-201A 2M FM MOBILE TRANSCEIVER
TM-401A 70 CM MOBILE TRANSCEIVER
Complete with Remote Frequency Controller

$20 ST-1 AC-DC BASE STAND

KR-250 LIGHT DUTY ROTATOR

$65

SAVE $30

$15

SAVE $10

SC-3 SOFT CASE FOR TR-2400

TDC-140 DC/DC CONVERTER
Converts 24V DC to 13.8V DC at 4 Amps.

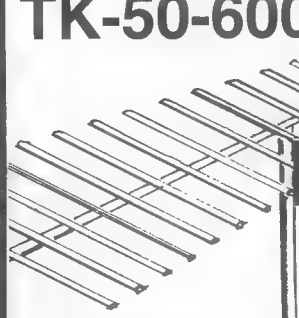
$60 **SAVE $40**

AX-103 VOICE SCRAMBLER
10,000 Combinations

$299 **SAVE $100**

TK-50-600

SAVE $50



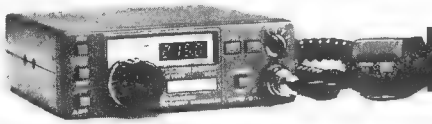
$160

19 ELEMENT LOG PERIODIC

PLUS FREIGHT

Frequency range 50 MHz to 600 MHz continuous. Use for 6 metres, 2 metres, 70 cm, 50 cm, TV, ATV, FM, Scanners etc. Boom 3 metres — Longest element 6.5 metres — Average gain 8dB — 300 watt balun included.

DFC-230 DIGITAL FREQUENCY CONTROLLER



$160

SAVE $100

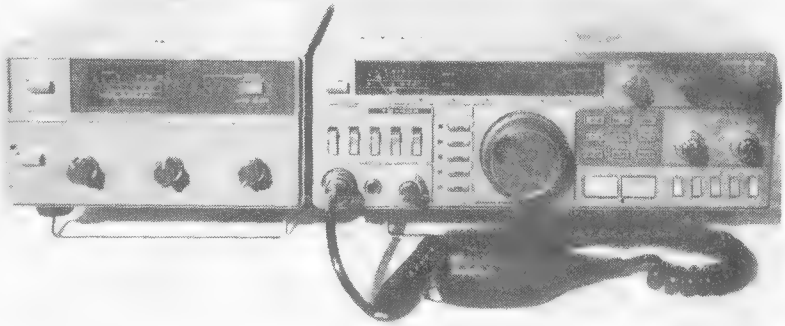
Matches TS-130 Series and TS-120 Series (also compatible to TS-830S or TS-530S).

Available from TRIO-KENWOOD
4E Woodcock Place, Lane Cove, Sydney, N.S.W. 2066,
either by counter sale or mail order ONLY. PLUS FREIGHT

PARAMETERS PTY LTD
PERFECTION IN MEASUREMENT

KENWOOD

THE MOST VERSATILE HF TRANSCEIVER OF THE 80'S



TS-43X HF TRANSCEIVER

The TS-430S combines the ultimate in compact styling with its conterparts in advanced circuit design and performance. An all solid-state SSB, CW, and AM transceiver, with FM optional, covering the 160 – 10 meter Amateur bands including the new WARC bands, this remarkable radio also incorporates a 150 kHz – 30 MHz general coverage receiver having an extra wide dynamic range. Key features include dual digital VFO's, eight memory channels, memory scan, programmable band scan, IF shift, notch filter, fluorescent tube digital display, built-in speech processor, all-mode squelch circuit, and a host of orther features designed to enhance its versatility and flexibility of use in Amateur operations.

Contact us for the complete range of TRIO-KENWOOD products.

Melbourne Office: 53 Governor Road, Mordialloc, Victoria 3195. Phone: (03) 580 7444
Postal: PO Box 122, Mordialloc, Victoria 3195 Australia Telex: AA 33012
(Incorporated in Victoria)

ATN ANTENNAS

ATN ANTENNAS

56 Campbell Street, Birchip, Vic, 3483.
Phone (054) 92 2224

Due to a large expansion programme, the following exciting products will become progressively available in the near future:

1 All aluminium lattice towers (guyed). The approval of the Department of Labour and Industry is expected in the near future. The computations have been done by a chartered engineering consultant.
WIDTHS 175, 250, 380, 450 mm.
MAX Hgt 25, 40, 60, 75 metres.
WEIGHTS 1.0, 1.5, 2.4, 3.5 kg/metre.
SECTIONS: Standard; 5.80, 2.90 metres. (19 ft & 9.5 ft). To fit Comet truck!
MAINTENANCE: NIL!! Due to TIG Welding by a certified operator and the use of the best available aluminium in Australia 6063-T83, the greatest strength and corrosion-resistance is guaranteed.

2 Tilt over and crank up towers . . . Early 1985.

3 Parabolic dishes at affordable prices 2, 3, 4, 5 & 6 metre diameters . . . February 85.

4 1, 2, 3, 4 & 5 element high gain beams using lattice tower for booms on 40 metres. Don't miss out on that fine DX . . . October 1984.

5 1, 2, 3 & 4 elements on 80 metres!!! . . . December 1984.

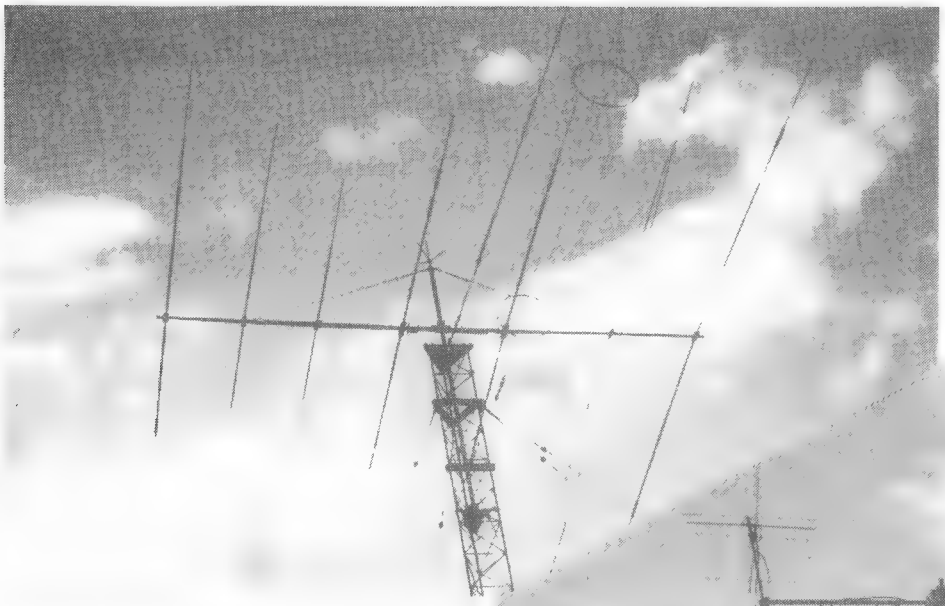
6 Log-periodics from 3.5 MHz and up . . . January 1985 13 MHz and up available now.

7 Range of highest quality BALUNS to 5 kW. 1:1, 4:1 for dipoles, inverted vees etc.

8 On special order, we can design and supply RHOMBIC ANTENNAS including towers, guys, wire, porcelain insulators, terminating non-inductive resistors etc, etc. DEBEGLASS Fibreglass guys 4 and 5 mm dia. 20% stronger than steel cable!!

We are continually improving our comprehensive range of products and also introducing new lines. By supporting our products you are helping to reduce the unemployment level in our area and are supporting the training of apprentices!

HELP AUSTRALIANS! — BUY AUSTRALIAN MADE!!!! WRITE FOR FREE CATALOGUE
DEALERS IN ALL STATES



HF antenna.

Satellite antennas for 2 m and 70 cm.

VISIT TO CHINESE RADIO SPORTS ASSOCIATION

Steve Medley VK3VYE
59 Fewster Road, Hampton, Vic, 3188

David Long VK3BY
21 Fewster Road, Hampton, Vic, 3188

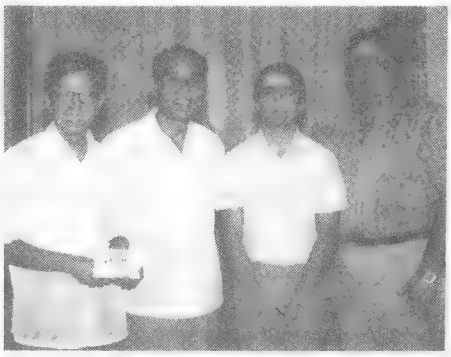
It was with great excitement that Steve VK3VYE and David VK3BY arrived in Biejing on 12th August. At last they would be visiting BY1PK. David had written to BY1PK and had been successful in obtaining an invitation.

Immediately upon arrival they gave their invitation to their guide, who attempted to contact the station to arrange a visiting time, but Murphy was in fine form on this day as everyone had gone home! However, the helpful guide was able to arrange a visit with Mr Wang Qianya, Deputy Secretary General of Chinese Radio Sports Association, Mr Yan Pidung, Operator of BY1PK and Mr Huang Yongliang, the Official Interpreter that evening in David and Steven's hotel room.

Gifts from the WIA were presented to and gratefully received by Mr Wang on behalf of the CRSA, and a return visit to BY1PK was arranged for the following afternoon.

After being caught in a traffic jam (they have them in China too) they were greeted by Mr Yan who explained the history of BY1PK before showing them over the station.

BY1PK first commenced operation in 1958 and by 1963 there were six active stations in China, however all radio activity was ceased in 1966 by the Cultural Revolution.



From left - Mr Yan, Mr Wang, David VK3BY and Steven VK3VYE.

Amateur radio operation was re-activated in March 1982 and since that time BY1PK has had over 10 000 contacts with eighty eight countries. Main contacts are with Japan or the USA, with JA QRM being very strong.

The two main operators are Mr Yan and Mr Tong, both teachers of Radio Electronics. During summer vacations many students operate BY1PK on both CW and SSB.

There are also three new stations operating in China, BY1QH in Biejing, BY4AA in Shanghai and BY8AA from Chengtu and shortly it is hoped to have BY5RA operational from Fulin.

Currently the Government only issues licenses to club stations and does not approve licenses to foreign amateurs however the CRSA hopes that this will be altered in the future.

AR

VICOM Australia brings you the new Tono Series 5000E Communications Terminal

- AMTOR Feature
- Low-rate Spurious Radiation
- Built-in Time Clock
- Timer Transmission/Receiving Feature
- Selcall System
- Built-in Demodulator
- Pre-load Function
- "RUB-OUT" Function
- Automatic CR/LF
- WORD MODE Operation
- LINE MODE Operation
- WORD-WRAP-AROUND Operation
- Automatic Idle Insertion
- "ECHO" Function
- Cursor Control Function
- Test Message Function
- CW Ident Function
- MARK-AND-BREAK (SPACE-AND-BREAK) System
- Variable CW Weights
- Audio Monitor Circuit
- AFSK Modulator
- Built-in CW, FSK Keyer
- Automatic Transmit/Receive Switch
- ASCII Key Arrangement
- Battery Back-up Memory
- "SEND" Function
- Printer Interface
- CW Practice Function
- CW Random Generator
- Bargraph LED Meter for Tuning
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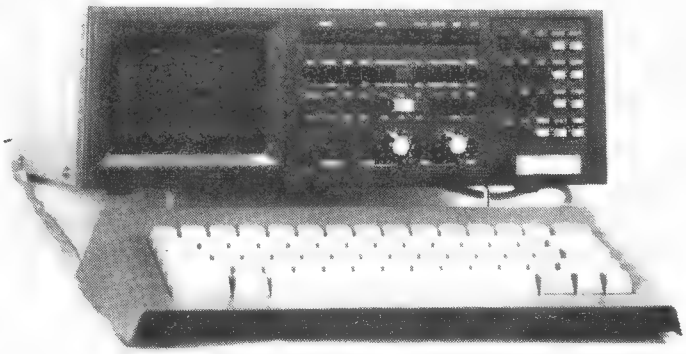

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DMC-2	PLASTIC COMPONENT CASE (KITS)	18.00		27.00

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MINISTER'S ADDRESS

1984 WIA REMEMBRANCE DAY CONTEST

The following is a transcript of the opening speech, by the Minister for Communications, for the 1984 Remembrance Day Contest.

I was most pleased to receive the Institute's invitation to open the 1984 WIA Remembrance Day Contest. Since my appointment as Minister for Communications, I have been particularly impressed by the aims and activities of the Institute. In many ways, these themselves are reflected in the spirit of the Contest.

As you are aware, this contest perpetuates the memory of those amateurs who made the supreme sacrifice during World War II. I can think of no finer way in which they themselves would wish to be remembered.

The Contest itself provides an excellent opportunity for amateurs to demonstrate the major advances made in the art and the skills that have been developed over the past forty years. We are all aware how well these skills have been employed to the benefit of our fellow Australians, particularly in times of disaster such as were experienced during Cyclone Tracy and the most recent horrendous bushfires in both Victoria and South Australia.

What better reasons than these for the Institute to have inaugurated and continued an event of this nature. This annual contest, founded to honour selflessness and valour, is known for its spirit of comradeship and for the fact that it fosters and encourages the development of skills which can be used to the benefit of our fellow man.

The Contest also presents an excellent opportunity for amateurs at all levels to enjoy their interest while participating in a competitive environment. I understand it is open to all, from the least experienced to the most experienced, and see it as a showcase whereby the excellent training provided by the Institute to its members is amply demonstrated.

I believe I should say at this point that I find my portfolio to be a most challenging and exciting responsibility. I also firmly believe that we are all on the threshold of major advances in the communications field and in the means by which these can be managed in the most effective manner possible.

The launching of our national satellite system scheduled for late 1985 via the NASA space shuttle, will be a tremendous boon to the people of Australia. The system will complement, diversify, and strengthen our existing communications systems and in addition, provide a capability for services not currently economically viable.

The Minister for Communications, the Honourable Michael Duffy.

Similarly, the proclamation of the new Radiocommunications Act will enable more comprehensive control of spectrum use. The new Act contains provisions to effectively regulate the many technological advances achieved in the field of communications which have occurred in recent years. It is a major advance, replacing the long-standing but now outdated Wireless Telegraphy Act which was proclaimed shortly after Federation, in fact back in the days of spark transmitters.

It is significant to note that when submissions were invited during the drafting stages of the Act, both the Institute and many of its members made highly valuable submissions to Departmental officers engaged in the drafting process.

As I have no doubt that you are all very keen to commence, I wish you all the best of luck and take much pleasure in declaring the 1984 Remembrance Day Contest now open.

AR

STOLEN EQUIPMENT REGISTER

In accordance with 1984 convention motion 84:17:01 the Federal Office has established a stolen equipment register.

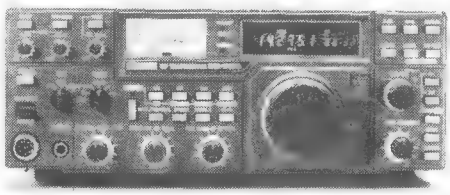
Members wishing to take advantage of this register, either to publicise their loss or to check equipment offered to them may write or telephone the Federal Office their queries.

To update the list published in the JULY issue:

MODEL	SERNUMBER	FROM
YAESU FT101E	8G350283	VK2SS
KENWOOD TR 2400	0061950	VK2DPM
YAESU FT 101E	81370414	VK3DYZ
YAESU FT200	2K332252	VK3DYZ
ICOM IC22S	14957	VK3DYZ
YAESU YP-150	81090469	VK2DCB
KENWOOD VF0520	—	VK2DCB
KENWOOD AT200	820049	VK2DCB
KENWOOD TS520S	820972	VK2DCB
KENWOOD DG5	730475	VK2DCB
KENWOOD SP520	—	VK2DCB

AR

THE NEW WORLD CLASS OF HF



Who would have believed that ICOM engineers could have improved the IC-720A. Now, not only do you have features such as the general coverage receiver, but now, in the IC-751 you get all modes including FM, transmitter incremental tuning (XIT), scanning and of course the tuning system made famous by Collins. Perhaps the most amazing fact is the 105 dB dynamic range, offered by the new J-FET ICOM front end.

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present
1985 AMATEUR TOURS

TRAVELAW

CHOICE OF SIX DEPARTURES TO EUROPE AND JAPAN!

Following the highly successful Electronics Tours to Japan in September and October, Paul Rodenhuis, VK2AHB of Travelaw is now arranging further holidays for the Electronics enthusiast. These will include two tours to Europe, three to Japan, and one combining both.

EUROPE 1!

Three departures, three itineraries to choose from:

A. 26 DAYS FROM $2850. 23rd MARCH — 17th APRIL.

This tour is designed for the enthusiast who wants to see the maximum that Europe has to offer, in a limited time. After departure from Sydney you arrive in Amsterdam to commence a 16 day tour which takes in Holland, Germany, Switzerland, Italy and France. You return to London on 9th April, giving you three days to explore this city and enjoy some factory visits before going on to Birmingham for the RSGB National Convention 13th — 14th April.

B. 33 DAYS FROM $3995 4th APRIL — 5th MAY.

This is the deluxe tour for the discriminating enthusiast. You will depart Sydney on 4th April for Tokyo where you will spend six days including EXPO '85 and factory tours around Tokyo. You will then depart Tokyo on 10th April arriving in London to join Tour C.

C. 26 DAYS FROM $3450 10th APRIL — 5TH MAY.

This tour is designed for the electronics enthusiast who likes to travel at a more leisurely pace. Factory tours of Plessey, BBC, Philips Siemens, and Blaupunkt will be arranged, as well as a visit to ITU headquarters. Free time has been allocated in most cities to allow you to explore them at your leisure. Accommodation is first class throughout. Tour C departs Sydney 10th April, arriving in London. After two days in London you move to your accommodation in Stratford on Avon. This will allow you to visit the RSGB Convention in nearby Birmingham. Following the convention you depart for a sixteen day tour of the continent returning to London on 30th April. You have a further two days here before returning to Sydney.

NOTE: Optional add-on tours of UK, Scandinavia, Italy, Greece etc are available for all Tours.

JAPAN — EXPO '85!

D. 27th APRIL RETURNING 11th MAY.

E. 11th MAY RETURNING 25th MAY.

Two Cherry Blossom tours of fifteen days each are scheduled for April/May. Both include time at the Tsukuba Expo '85, the theme of which is "Dwellings and Surroundings — Science and Technology for Man at Home". As well, we will include the highly popular factory tours to Mazda, National, Icom and Toshiba. Of course we will also include sightseeing in Tokyo, Kyoto and Hiroshima.

F. 21 SEPTEMBER RETURNING 5TH OCTOBER.

Our Autumn Electronics Show tour of fifteen days will follow the same pattern as 1984's, taking in the factory tours, sightseeing and the unbelieveable Electronics show.

Prices for these start from $1700. For a brochure which contains full information and tour itineraries, prices and conditions please return the slip to:

Paul Rodenhuis, VK2AHB.
Travelaw,
7th Floor,
130 Phillip Street,
Sydney, NSW, 2000.
Phone: (02) 233 8442.

Note: While these tours are in advanced state of preparation, some minor variations to departure and arrival dates may be necessary.

Name: ..... Call: .....

Address: .....

..... Post Code: .....

Phone No: ..... No. People: .....

Which tour? .....

Any add-ons? .....

EDUCATION NOTES

Brenda Edmonds, VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic 3199

The Department of Communications receives a fair amount of criticism from amateurs at times. Some of it may be justified. Some is not.

The newer licencees may not all be aware of the many gains and concessions that we have had from the Department in recent years.

The most recent of these is the availability of Morse exams at higher speeds for those seeking reciprocal licensing overseas.

We now have four exams per year at each level, with the results appearing on time, and over-the-counter licensing. These are some of the first stages of the Department's plans to streamline all aspects of amateur examinations and licensing. It is hoped that the examination frequency can be increased still further — perhaps to monthly — in the fairly near future.

Because most candidates are able to attend examinations at the city centres, we tend to forget those who are at some sort of disadvantage. The availability of Novice level theory examinations at the main country centres will be much appreciated by many of the country members. Some however, may be unaware that for the more remote candidates, examinations can be arranged in their local area when a Departmental Officer is in the district. Application is made in the usual way, and the dates are set by arrangement. If necessary, the CW examinations can be conducted with the receiving test on tape, and the candidate recording the sending under test conditions.

Similarly, candidates suffering from some sort of physical disability can be provided with special examinations as required, the type being adjusted according to the candidates disability, and the time arranged for mutual convenience.

The existing net time of 1130 UTC on 3.685 +MHz will continue on Thursdays. All welcome.

To conclude — best wishes to all candidates for the November exams. Sample papers should be available by the time you read this. *Don't forget!* — ***READ THE QUESTION!!***

73
Brenda VK3KT
AR

URGENT!!!!!!!

Please let us know of clubs and schools etc starting theory classes. Where, when, how much and whom to contact.

Contact Brenda Edmonds VK3KT.

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SM-8	Deluxe desk microphone	99 00
HM-12	Hand microphone with up/down scanning	29 00
EX310	Voice synthesizer module	88 00
RC-10	Frequency remote controlled unit	68 00
CR64	High stability Xtal	114 00
FL32	9 MHz CW/RTTY filter 500 Hz	56 50
FL63	9 MHz CW/RTTY narrow filter — 250 Hz	65 50
FL33	9 MHz AM filter — 6 kHz	53 00
FL70	9 MHz SSB wide filter — 2 8 kHz	52 50
FL52A	455 kHz CW/RTTY filter — 500 Hz	110 00
FL53A	455 kHz CW/RTTY narrow filter 250 Hz	110 00
IC-745	All band SSB AM (Rx only) Gen Cov Rx 16 memories	
PS35	Internal switched mode power supply	258 00
SM6	Desk microphone	57 00
SM8	Deluxe desk microphone	99 00
HM12	Hand microphone with up/down scanning	29 00
EX241	Marker unit	22 00
EX242	FM unit Tx & Rx	45 00
EX243	Curtis keyer unit	59 00
FL45	9 MHz CW filter — 500 Hz	65 50
FL44A	455 kHz SSB narrow filter — 250 Hz	99 50
FL52A	455 kHz CW/RTTY filter 500 Hz	110 00
FL53A	455 kHz CW/RTTY narrow filter — 250 Hz	110 00
FL54	9 MHz CW/RTTY narrow filter — 270 Hz	65 50
IC-740	No longer available Accs still available	
SM5	Desk microphone	57 00
EX241	Marker unit	22 00
EX242	FM unit	45 00
EX243	Curtis keyer	59 00
IC-730	10-80 m compact transceiver	
PS15	External power supply 20 amps	215 00
SM5	Desk microphone	57 00
HM7	Hand microphone with pre amp	22 00
EX202	LDA unit for use with AT100,AT500	19 00
EX203	CW audio filter	20 00
EX205	Transverter unit	19 00
EX195	Marker unit	33 00
FL30	SSB pass band tune filter	56 00
FL44	455 kHz SSB filter — 2 4 kHz	99 50
FL45	9 MHz CW filter	65 50
IC-720A	No longer available Accs still available	
PS15	External power supply 20 amps	215 00
CF1	Cooling fan for PS15	40 50
EX144	Mounting bracket for CF1	7 50
SM5	Desk microphone	57 00
FL32	CW narrow filter	56 50
FL34	AM Xtal filter	53 00
IC-R70	General coverage receiver 2-30 MHz	
EX257	FM unit	51 00
FL63	CW narrow filter	65 50
FL44A	455 kHz SSB filter	99 50
CK70	DC cable kit	15 00
70720	Interface unit to transceiver with IC-720A	99 00
IC-R71A	All mode general coverage Rx keypad entry	
RC-11	Infra red remote control unit	99 00
EX257	FM unit	51 00
CK70	DC cable kit	15 00
IC 2KL		1749 00
IC-AT100	100 watt automatic antenna tuner	499 00
IC-AT500	500 watt automatic antenna tuner	620 00
IC-PS30	System power supply 25 amp continuous	375 00
C-AH1	Mobile antenna 3 5 MHz-30 MHz	299 00
C-CT10	Computer interface for 751, 745 271 R71A	499 00
VHF EQUIPMENT		
IC-271A	Multi-mode base station 25W 32 memories	
IC-271H	High power version of above 100W	
PS25	Internal switched mode power supply 271A	189 00
PS35	Internal switched mode power supply 271H	258 00
EX310	Speech synthesized unit	68 00
AG20	Internal receive pre-amp 271A	95 00
AG25	Masthead receive pre-amp 271H	112 00
SM6	Desk microphone	57 00
IC-290H	25W multi-mode mobile, 5 memories	
IC-27A	25W FM mobile 9 memories multi-function	
IC-27H	45W FM mobile 9 memories multi-function	
UT16	Voice synthesizer unit	45 00
BU-1	Memory back-up unit for mobiles	39 50
IC-2A	Synthesized 2m FM hand held 1 5W	
IC-02A	Synthesized 2m FM hand held	
CA5	5/8 Telescopic gain antenna	24 00
ML1	10 watt booster unit for 2A	95 00
BP3	Standard battery pack	36 00
BP2	Low volt high	55 50
BP4	Empty battery pack (6 x AA size cells)	12 50
BP5	High volts high capacity (high power)	76 50
BP7	High volts high capacity (for use with 02A only) 5W	115 00
BP8	Low volts high capacity	105 00
DC-1	12V regulator pack (2A)	22 50
CP-1	12V charger lead for car lighter	7 50
FA-1	Helical antenna	12 00
LC-1	Carrying case (2A/BP5)	10 00
LC-2	Carrying case (2A/BP4)	10 00
LC-3	Carrying case (2A/BP3)	10 00
LCM-12	Heavy duty leather case (2A/BP2 3 4 5)	72 00
LC-11	Carrying case (02A/BP3)	15 00
LC-14	Carrying case (02A/BP7)	15 00
HS-10/SA	Head set with boom mic (VOX/02A only)	75 00
HS-10/SB	Head set with boom mic (NTT/2A 02A)	75 00
SS1	Shoulder strap	15 00
BC-36E	Desk top drop-in charger (all batt packs)	99 00
HM-9	Speaker microphone	
UHF EQUIPMENT		
IC-471A	Multi-mode base station 25 watts, 32 memories	
IC-471H	High power version of above 75 watts	
PS25	Internal power supply for IC-471A	189 00
EX310	Voice synthesizer unit	68 00
SM6	Desk microphone	57 00
IC 490 A	Multi-mode mobile 10W 5 memories	
IC-47A	FM mobile 25 watts 9 memories	
IC-45A	FM mobile 10 watts 5 memories	
BU 1	Memory back up unit for mobiles	39 50
AG1	Masthead pre-amp for 471A/451/490	95 00
AG35	Masthead pre-amp for 471H	128 00
IC-4E	Synthesized hand held 1 5W	
IC-04A	Synthesized hand held K'pad entry LCD	
1.2 GHz EQUIPMENT		
IC 120	FM transceiver 1 watt output	699 00
CA1200	Mobile antenna, gutter mounted cable	126 00
ML12	10 watts booster with pre-amp	450 00
PS45	External power supply 8 amp	199 00

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IC 009

HOW'S DX

Ken McLachlan, VK3AH
Box 39, Mooroolbark, Vic 3138

With the announcement of the impending increase in postal charges within the country of approximately 10%, it is a safe bet that international mail charges will increase proportionately as they did with the last internal boost. This increase is going to place a further financial burden on the direct QSLer (admittedly in some cases the only way to receive a card is via the direct route) and non-members of the Institute.

As one of the many benefits members of the Institute enjoy are the privileges of the Outwards QSL Bureaux for a minimal outlay and in at least one Division, for no charge at all. All the hard work of sorting and packaging is done by dedicated volunteers, the only outlay being the postage.

If reading this prompts you to contact a non-member, do it now and make him or her aware of the benefits that are available, not forgetting the hidden benefits such as being a member of the Society that negotiates on every amateur's behalf for the privileges we now enjoy and many take for granted such items as the funding, maintenance and payment of the licence and electricity bill for the repeaters that are consistently in use.

It is with deep regret that I have to report the sudden death of Hugh VK6FS, who became a Silent Key on the 19th September. Hugh, apart from being a personal friend and consistent contributor to this column over the last three years, was dedicated to the hobby and the Institute, having just taken over the unenviable position of Awards Manager.

Over the many years that the call sign appears in my log, Hugh was always prepared to advise and assist any amateur needing help and it is known that he was the first to volunteer for the arduous and time consuming tasks within his division. Hugh, though on a limited income purchased out of his own savings a generating unit for the VK0HI Heard Island Expedition and on its return it was serviced and handed over to WICEN for their use. VK6"FLYING SAUCERS" as he "nick-named" himself will be missed but not forgotten by his friends from many nets, all amateur bands and particularly this QTH.

It is also sad to report the passing of Percy LU5XE, on the 7th of September. Percy was an avid DXer, a true gentleman and a friend well known to VKs over many decades for vivid descriptions of the large sheep station he managed that was located on the shores of Lago Argentina. Condolences to his XYL Jean from his many friends on the bands.

SOUTH YEMEN

All preparations to have a 7O local on by the end of the year appear to be going to plan. It is anticipated that Selim OE6EEG, will appear for the initial contacts.

QSLs FROM CHINA

Tom Wong VE7BC, probably the person that has done more for the success of reinstigating the hobby in China by personal effort and donations than any other amateur, is worried about the cost of QSLing to the Chinese amateurs according to a letter he has distributed.

Tom notes that the BY amateur does not pay dues to his or her club and generally has very little or no money at all. They cannot afford mailing and the only currency that can assist them is IRC's. "Green stamps" or any other currency is valueless.

Generally one IRC is sufficient to any country in the world, that participates in the IRC scheme, for return by surface mail. Air mail is very expensive and from all investigations that I have carried out, three IRC's should just cover their expenses. Australia Post now charges 70c per IRC!

QSL MANAGER CHANGE

A change of QSL arrangements has been made concerning Karl K4YT, who is presently signing /DU. KE3A has taken over the duties from W2TK being effective immediately.

SYRIA

Activity out of Syria has been by OE8AJK/YK, a member of the United Nations Peace Keeping Corps who has been active on twenty metres. He intimates that he is operating from the Golan Heights. QSL to the home call.

Another station purported to be active from the same location is VE1CHG/4U.

ZIMBABWE

One of the most consistent amateurs from this area with a signal into VK is Z21BP. A profile of Jim was written on p32 August 1982 AR and eventually a photograph has been acquired.

Jim Z21BP with his XYL Frances in the "shack".

LOW BAND DXCC

The ARRL have struck a 160 Metre DXCC Certificate with all contacts for accreditation, on or after 15th November 1945. There will be no Honour Roll for this certificate.

DOCUMENTATION

Still no sign of any of the necessary paperwork on the ARRL DXCC Desk for operators from some of the rare spots. Amongst these are 5U7LD, 5X5GK and ET3PS.

Documentation that has been received is approved for the operations of 3V8AI (IN3XAI) and 3V8ZY (IN3RZY). The 1983 operation of TS83WCY is not acceptable for DXCC credit.

PREFIXES PLUS

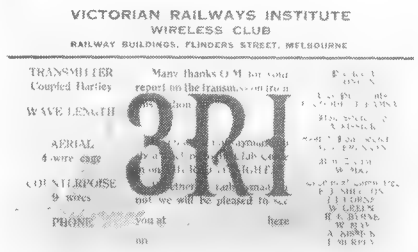
The optional prefixes of XJ1 to XJ8 in lieu of VE1 to VE8 were allowed for the Papal visit to Canada between the 9th and the 20th September, as well as the special station CZ2P. VO1 and VO2 amateurs were allowed the use of XK1 and XK2. VY1 had the choice of CJ1.

ST KITTS — NEVIS

Effective from the 19th September, the first anniversary of their independence, VP2K will be replaced by V4A. The suffixes are expected to stay the same with non-resident operators using the home call /V4A. Such as VK3AH/V4A, *but no such luck unfortunately!*

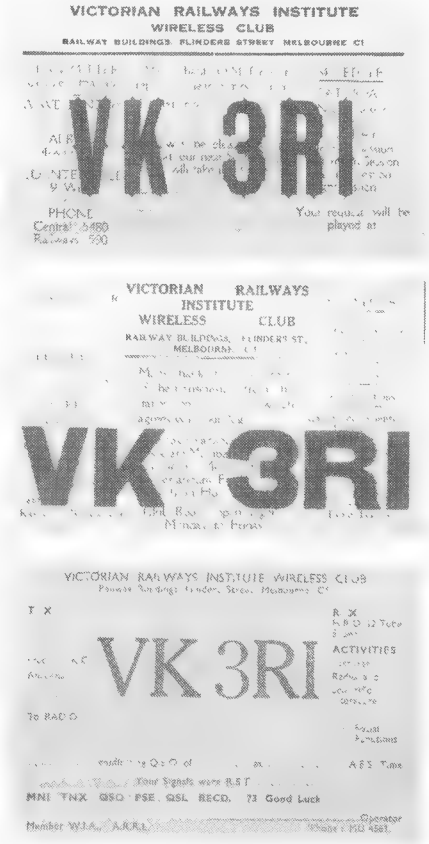
CARDS OF YESTERYEAR FEATURING LOCOMOTIVES

Kevin VK3CKC, kindly sent me some cards of VK3RI, the call sign of the Victorian Railways Institute Wireless Club since 1927. Shown are the QSL cards used over the years.

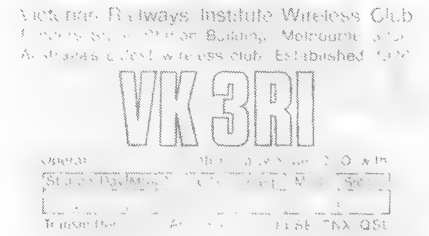


The first card used by the Club.

This card shows an A2 Class locomotive which was introduced into service in 1907. In all 185 were built at the Railway Workshops and were retired after 50 years service. The last two locomotives were retired in April 1962 from the Spirit of Progress Run between Melbourne and Albury.



Various other cards used by the Club over the years.



The current QSL card.

The locomotive shown on the present card is a S300 type, named the "Matthew Flinders", and was built in 1928, after the inception of the radio club. This loco was streamlined in 1937, along with three others for the Spirit of Progress.

The Club runs two nets, each Wednesday at 1900 hours local time on 3.585 MHz and on Sundays at 2115 hours local on 52.08 MHz. Amateurs who check into the net for the first time are sent the current QSL card. There is no obligation or request to reciprocate.

Unfortunately the cards depicting the locomotives and Flinders Street Railway Station are in light blue which is not conducive to good magazine photographic reproduction.

NAME CHANGE FOR XT2

Upper Volta's name has been changed to the Popular Democratic Republic of Burkina Faso. I prefer the former name and this one is going to be a hard one to remember let alone get the tongue around and the spelling correct.

A NEW COUNTRY??

The residents of Aruba (PJ3 and PJ4) in the Netherland Antilles are working towards their independance from Curacao. One day, in this century, there could be a new country.

POSTHUMOUS AWARD

The many friends of the late Richard (Dick) Spenceley KV4AA who became a silent key in July 1982 will be happy to know that he was posthumously awarded the first radio amateur entry in the Guinness Book of Records (April 1984 edition) as the radio amateur with the most QSO's. Dick achieved the distinction with a record 48,100 QSO's over 365 days in 1978. I am proud to be in the log a number of times that year.

PROVED WRONG

I am the first to admit it, not because the call is in the log and the card is well on its way, but all DX Editors had no idea that San Felix and San Ambrosio Islands located 860 kilometres west of the Chilean coast and one of the most wanted countries in the world, would be activated. A recent statement from the Radio Club de Chile inferred 1988. The Radio Club de Chile and the Chilean authorities, were far from impressed with the KF1O/CE0X farce of 1981 and at that time they said they were working to put a genuine operation on for the DXers throughout the world.

Apparently what was a closely guarded secret, *which was successful*, was that the Radio Club de Chile was working closely with the Chilean Navy to put two experienced commercial CW operators on the island (civilians are not permitted to land on San Felix), that would be operational for a considerable time even up to the first week of this month. It was decided to use the same suffix as the Chilean Society (CE3AA) with the CE0 prefix and both operators, Max and Fernando would use the same call.

At the time of writing, not many VK's had been fortunate to be around at the right time and the persistence of Phil VS6CT, including ISD calls to Santiago, helped most of the Asian and Pacific stations that made it to gain the new one. On behalf of these stations, including myself, Phil our sincere thanks.

QSL information is PO Box 700, Santiago, Chile.

In my opinion, it was quite unnecessary for a group of DXers from a number of countries to congregate on a well monitored frequency and discuss the legitimacy of the operation. It was quite apparent that they had not been successful in their effort of obtaining a confirmed QSO. To the best of my knowledge both operators have commercial qualifications as well as having operated from CE9 and are operating with the blessing of the Chilean authorities.

VK-JA FRIENDSHIP

When Bob VK2BTJ visited JA, he and his travelling companions, were entertained by a long standing friend in Yoshio JA3FEG, his XYL Michiyo JF3JOK, and the family.

From L-R Front Row: Michiyo JF3JOK, Keiko, Hitomi and Yoko. Back Row: Keith, Bob VK2BTJ, Tony and Yoshio. Keith and Tony were travelling with Bob.

Yoshio in his well appointed "shack". Note the WAVKCA Certificate that is proudly displayed.

MORE ACTIVITY FROM ANTIGUA

Grant KA2DIV/V2A, is active again from this island and should be QRV until at least the New Year. QSL via WB4OSN.

SILVER ANNIVERSARY

Congratulations to the SPDXC (Polish DX Club) on their Silver Anniversary in September. Of over three hundred members, ten members have over 300 countries confirmed and over 100 have attained a level of between 200 and 300 countries on the ARRL DXCC List. In addition some members are on the Honour Roll and have 5BDXCC.

BITS AND PIECES

Honest amateur K6UA is sending out his K6UA/A6 cards that are unacceptable for DXCC. Wording on the card includes the notation "operation illegal and unauthorised". **** I2YAE has no knowledge of being elected "Manager" to the phony call 6O84TI. **** Was JH8YDY/S21 duly licensed? According to sources in JA, the answer is no. **** A total eclipse of the Sun will appear across part of the Philippines, South Pacific, Australia, New Zealand and South America on the 22nd and 23rd of this month. **** The monks at Mount Athos are still very reluctant to issue any permission for anyone to operate from their area. **** The Soviet authorities have created another call area in the Asiatic R S F S R using callsigns in the series UA8T, UA8V, UZ8T, UZ8V and RA8T etc. **** H44IA active on CW around 7.006 MHz at 1200 UTC most nights. **** 4K1H active on twenty metre CW giving his QTH as Russkaya (Antarctica). Is any reader able to supply the coordinates or any information on Russkaya please? **** JAS-1, the Japanese Amateur Satellite is due to be launched in February 1987. **** XYL Tammy A22TE, is looking for CW contacts on 14.001 to 14.020 MHz between 1600-1800 UTC. (Predictions indicate it is a little late for the east coast.) **** Botswana now has 52 licensed amateurs. **** LA5VAA has made 1985/1986 as his target to be the first to operate Peter 1 Island! **** A genuine operation from Revilla Gigedo may be on the air waves next April. **** FB8WJ and FB8WK due to leave the Crozet Islands this month. No hint as to whether there will be any activity from the new crew as yet! **** Andy VK9ZA, worked a number of W's on 80 metres in early September but no luck on QSYing to 160 metres. **** It is believed that Soccoro PY1EFM/PY0T has passed his logs over to Eva PY2PE. For those still awaiting a card it would be worth a try! Eva's postal QTH is PO Box 19094, 01000 Sao Paulo SP, Brazil.

THANKS

Sincere thanks go to the following. The Editors of weekly, bi-weekly and monthly newsletters including the ARRL NEWSLETTER, PHILIPPINES RADIO RELAY LEAGUE — QSP, RSGB DX NEWS, QRZ DX, LONG SKIP, DX FAMILY FOUNDATION NEWSLETTER, BOTSWANA AMATEUR RADIO SOCIETY NEWSLINE, JAN and JAY O'BRIEN'S QSL MANAGER LIST, KH6BZF REPORTS. Magazines including CQ, cqDX, QST, RADCOM, JARL NEWS, KARL NEWS, OZ, JARL NEWS, WORLD RADIO, 73, BREAK IN and VERON.

Members who have contributed include VKs 1WK, 2PS, 3BY, FR, YJ, YL, CKC, DNC, 4BHJ, the late 6FS, NE, 9ZA and G3NBC. Overseas amateurs include G1EOD, I8SAT, JA3FEG, Z21BP and ZL1AMM. Thanks to one and all and good DXing to all.

QSL MANAGERS

3D6AN:*WK4Y*, 4K0B:*UA1MU**, 4K1CEY:*UY5DJ**, 4N5A:*YU5KXY*, 5N1OL/5H1:*N0AFW*, 5U7LD:*IN3RZY*, A35SA:*JM1MGP*, AH8A:*K6EDV*, AP2SQ:*W3HNK*, C30LAV:*EA3CTE*, C30LBK:*EA3TJ*, CE9AJ:*CE3AA*, *ED2EEE:EA2AJT*, *F5RV/TK:F5RV*, *F6HIX/J73 F6EYS*, FB8YK:*F6EMY*, FG7CT:*FG7BT*, FO0ZZ:*DF7NM*, FV4VAR:*F6GFC*, GD4XCY/A:*G4XCY*, *HB0NL:HB9NL*, HH2Q:*I2YAE*, HI3TGS:*N2BAY*, HL9WK:*KA1CWK*, HS0JUA:*JA1SDV*, HX4MWC:*PA0HEL*, HZ1AB:*K8PYD*, IY4FGM:*I4IKW*, JT1AO:*W7PHO*, JW6BAA:*LA7JO*, LA2EX/3X:*N4CID*, LA6BBA/OH0:*LA6BBA*, LZ40KVV:*LZ Bureau*, OK6SNP:*OK3KBB*, OK7SNP:*OK5SNP*, OX3AF:*N0AFW*, OX3KP:*OZ1HDF*, OX3LV:*W3HNK*, RI8CA*:*RA3AR (2 way contacts)*, RI8CA*:*UA3AQP (SWLers)*, RJ6K*:*UJ8JMM*, T30AY:*WB6LED*, T32AB:*N7YL*, T3AY:*WB6LED*, TA1AS:*DJ0OC*, *TA1MB:K2UO*, TI8RP:*F6GKU*, U9Z:*UA9YEW*, VP2M:*WB2LCH*, VQ9AC:*KA3CDN*, YJ8GX:*F6GXB*, YT2P:*YU2CBM*, YZ0U:*YU2BHI*, ZL7PO:*ZL4KI*, ZP5XDW:*N4DW*.

*Note: * Only via PO Box 88, Moscow.*

QSL MANAGERS

9Q5RN	PO Box 12646, Kinshasa, Zaire.
9V1VP	Bob Fursar, Jungstrasse 16, D-6365 Rosbach 1, West Germany.
A35CA	PO Box 684, Nuku Alofa.
A4XJP	PO Box 230, Misirah, Oman.
BY1PK + +	PO Box 6106, Beijing, Peoples Republic of China.
BY4AA + +	PO Box 205, Shanghai, Peoples Republic of China.
C21KH	PO Box 204, Nauru, South Pacific.
CE0AA	PO Box 700, Santiago, Chile.
CO2KK	PO Box 1, Havana, Cuba.
H44IA	PO Box 219, Honiara.
H44R	PO Box 258, Honiara.
HL1EJ	PO Box 6152, Seoul.
JY5CI	PO Box 616, Amman, Jordan.
KX6DS	PO Box 4563, Huntsville, AL 35815, USA.
OX3KM	PO Box 103, Godhavn, DK-3953, Greenland.
RI8C**	MM, PO, Box 15, Izhevsk, 426064, USSR.
T2ADE	PO Box 5, Funafuti, Tuvalu, South Pacific.
TA1MB +	PO Box 1167, Istanbul, Turkey.
TA1MN +	PO Box 33, Istanbul, Turkey.
V85TT	PO Box 222, Brunei.
YI1BGD	PO Box 5864, Baghdad, Iraq.
ZD7BB	PO Box 17, Jamestown, St Helena.
ZZ2CW	PO Box 676, Goiania, Brazil.

*Note: ** Direct contact approved!*
+ No mention of the hobby to be on the envelopes!
+ + Refer notes this issue.

SOME STATIONS THAT WERE WORKED BY EAST COAST STATIONS ON TWENTY METRES

3A2EE, 3D6AN, 3V8AI, 6Y5MC, 8P6HX, 9M2PW, C21BD, C21FS, C30LBM, BY1PK, CE0AA*, CE0AA, FB8YK, FV4VAR, HA5KDQ, HA5KFL*, HA9RE, YB9ADD, HH7PV, IS0QDU, J6FYC, JY9TS, K8AOG, LA9TCA, LZ2KRM, OD5QS, OE5BGL, OH2RF, ON7TK, OZ4BO, PA3CTM, PP8GW*, RB5WA, SP4DC, SP4JWR*, SP9CEM*, SV0DB, SV1SQ, T2ADE, TA2RA, TI2CRM, TR8CR, VK9ZA, VO1AW*, YI1BGD, ZK2IK, ZS1OU.

** Denotes CW operation.*

AR

YOEVIL TO YEOVAL

For some time the long cherished ambition of members of the UK Yeovil Amateur Radio Club has been to contact fellow amateurs in VK Yeoval.

Don McLean spent much time researching the situation and finally on 30th April 1984 his research paid off.

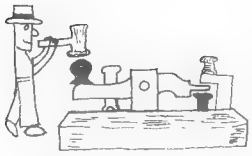
Don G3NOF together with Peter G3CQR and Tim G4WMV spoke with Joy VK2EBX.

Yeoval, NSW, was named after emigrants who settled there many years ago from Somerset, UK.

Joy emigrated from Surrey some thirty years ago and is the only amateur in Yeoval.

Contributed by Joy Collis VK2EBX

AR



POUNDING BRASS

Marshall Emm, VK5FN
GPO Box 389, Adelaide, SA 5001

There's been quite a bit of mail in the last few weeks, much of it from new brass pounders who are pleased that the column is going back to basics. I'd also like to thank Fred Lubach VK4RF who sent a list of his pet peeves, including:

Endless CQs, especially by overseas ops — twenty five to thirty CQs before a callsign . . . What's wrong with the three by three CQ?

People who send KN (meaning "named station only please go ahead") after a CQ . . .

Otherwise good Morse spoilt by lack of spacing . . . How often have you heard NAME sent as NAG?

Too many CW contests . . .

Fred's been VK4RF since 1936, and reckons he must be getting old, but what the heck — without the old-timers to pass on the traditions and procedures, operating would be by Rafferty's rules.

Both Ward Long VK3NAJ and Alan Chapple VK5PAK wrote about the difficulty of finding operators patient enough to work the less experienced operator at a reasonable speed and without using a lot of jargon. This can be a real problem, and I well remember, when I first started, how frustrating it was to send a CQ only to have somebody come back twice as fast, saying things like "GE OM TNX CALL UR SIGS FB . . ." etc.

As I said many months ago, a slow operator should use abbreviations wherever he can; a faster operator should avoid them.

But of course, it doesn't make much difference whether you abbreviate or not if you have a basic speed incompatibility. The golden rule of speed says that you should answer a CQ at the other operator's speeed if he is slower than you are — if he is faster you should answer at the speed you want to work, and he should slow down to your speed. The ideal, of course, is to work back and forth until you find the highest speed that both operators can copy.

There are bound to be anomalies, I guess. More than once I have called CQ at eight or ten WPM to attract answers from novices, and enjoyed a pleasant if slow QSO, only to hear the same novice working someone else at 15 WPM a few minutes later!

There is also an answer to the problem in correct application of standard operating procedures — if you are having trouble copying, you should never hesitate to send QRS 10, or QRS 5, or whatever (meaning "please reduce your sending speed to -- WPM"). Note that the desired speed should be specified — if you send QRS without nominating a speed, the other station will slow down too much or too little. If he gets it just right it was a coincidence. If you think it's embarrassing to ask someone to slow down, just remember that it will be much *more* embarrassing if you can't copy what he's sending.

As for what to say, the good old "rubber-stamp" QSO takes some beating. You should at least exchange name, QTH, and signal report, and it is also customary to exchange details of rig, antenna, and weather. The order is optional, but common sense dictates that the information should be sent in order of importance. The order given above is a fairly common format, usually taking two overs to get it across.

Having exchanged the "standard" information, a decision has to be made whether to continue the QSO or terminate it. If you want to continue, you might ask a question about something the other station has sent, or give him your age and occupation. If you want to finish the QSO you should answer any questions you have been asked, thank the guy for the QSO, and end it.

Ending a QSO seems to present difficulties to a lot of ops. You don't want to appear to be rude, but you really do want to make some more contacts. Well, the other guy is probably in exactly the same position, and he'll thank you for ending it gracefully. Once you are sure that all information has been copied adequately at both ends, all you have to say is:

OK JOHN TNX FB QSO ES HOPE CU SOON BT FER NW 73 73 ES GL ES GN AR (callsigns) SK

That translates as "OK, John, thanks for a fine-business chat and I hope to see you soon. For now, 73s and good luck and good night . . ." He will respond in kind, and probably finish with "SK E E" to which you may respond with "TU 73 SK EE", after which you will hear his final "E" by way of "cheers". Nothing to it — certainly no need to make up excuses like "the XYL wants me" or "I better go see if the tower's still standing". No muss, no fuss, and no time wasted.

Before we finish for the month, Alan VK5PAK came up with a pretty good match-making idea. If you are able to designate a time and frequency where you can usually be found for a bit of a CW chat, let me have the details, and I will publish them here in the column. Suggested format would be —

CALLSIGN, NAME, DAY(S), FREQ, TIME (UTC), SPEED

The speed would be the speed you want to work, so that interested readers who want a QSO at that speed will know where to find someone with similar interests. Please bear in mind that the column is printed several months after it is written, so don't give me the details unless you are reasonably certain to be available for the next few months. **AR**

INTRUDER WATCH

Bill Martin, VK2EBM
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

The intruder "UMS" who is USSR Naval Radio, has now well and truly moved back from 14.141 MHz to his summer spot on 21.032 MHz. By now, at the time of writing, the complaint has been sent to the DOC, and was a result of many hours of work by many dedicated intruder watchers. You will recall that the IW had mounted an intensive campaign against this intruder, but, of course, it is too early to gauge the effect of such a campaign. Many thanks to all those amateurs who reported the transmissions of this nuisance intruder.

Quite recently, I passed on some information via the VK2 WIA Broadcast, and it certainly bears repeating here for the benefit of those who are not privy to the VK2 Divisional broadcasts. I refer to the activity of fishing vessels, whose home ports are either Japan or Taiwan. The Intruder Watch receives many reports of activities by these fishing vessels. Now for the bad news; these transmissions are legal, and *are not intruder* transmissions on the 80 metre band. These vessels operate in (?) or near Australian Territorial waters, and are often quite strong. However, in IARU Region 3, of which Australia, Japan, and Taiwan are a part, the 80 metre band is a SHARED band, and the frequencies 3.5 to 3.7 MHz are NOT EXCLUSIVE to the Amateur Service. Any fishing vessel operating from home ports in Japan or Taiwan are in fact authorised to use these frequencies.

Just to change the subject for a moment, for the information of readers, I would like to state the list of frequencies which can be considered to be exclusively for amateur useage:

7.050-7.100 MHz;
14.000-14.250 MHz;
21.000-21.450 MHz; and
28.000-29.700 MHz.

These frequencies are EXCLUSIVE to the Amateur Service. We are all aware of the problems of commercial activity on the 40 metre band, of which the main offenders are China and Albania. The DOC has recently complained to The People's Republic of China, via the Foreign Office re this activity, but I have no results as yet regarding the complaint. Interestingly enough, the 40 metre band is shared between 7.000 MHz and 7.050 MHz by the Amateur Service and stations of the fixed service in the following countries: *Angola, Iraq, Kenya, Rwanda, Somalia, Togo, Egypt, Ethiopia, Guinea, Libya, Malagasy Republic, Malawi, and Tanzania.*

Usually, however, we do not experience any great QRM from stations in these countries. Perhaps the authorised amateur allocations are not as great as we think? Any enquiries regarding the activities of the Intruder Watch can be directed either to your Divisional Intruder Watch Co-ordinator (details in 1984/5 Call-Book, page 177) or to myself, VK2EBM, QTHR. Many thanks to all supporters of the Intruder Watch, and we are always seeking more amateurs and Short-wave Listeners to help our fight against the unauthorised transmissions. See you next month. **AR**

QSP

UK-CANADA SEMINAR BY SATELLITE

The world's first-ever seminar conducted by video satellite linked the Scottish and Canadian capitals in October in a $52,700 project aimed at showing how new hi-tech will change university education.

Highlight of the two-day seminar being staged simultaneously by Edinburgh University and Carleton University, Ottawa, was a two-hour satellite link-up during which an invited audience of academics, businessmen, technical experts, policy makers and administrators were able to debate technology, innovation and social change with their opposite numbers on the other side of the Atlantic.

The link-up, using British Telecom's newly launched video conference service with large television monitors to provide pictures at both ends, was funded by Northern Telecom, the sixth largest designer and manufacturer of telecommunications equipment in the world which has interests in Britain and Canada.

from Information Technology from Britain — August 1984 **AR**

THE ULTIMATE PAGER?

The latest pocket pager released worldwide by NEC can receive messages up to 352 characters long.

It also has a memory which can save up to eight incoming messages so they can be read whenever the user wants.

Despite the super capacity of the NEC Information Display Pager it's extremely small — about the size of a credit card.

Submitted by Jim Linton VK3PC **AR**

PACKET RADIO

David Furst, VK3YDF
131 Church Street, Hawthorn, Vic. 3122

Much is happening in Packet Radio at present. There is an impending shake-out between the Vancouver approach and the AX.25 protocol from America. It is valuable to gain an understanding of what is happening and why, so that we may choose a standard that will ensure a long prosperous future for Australian Packet Radio.

The amateurs of America discovered Packet Radio a few years after the Canadians had first implemented it, and they developed their own American Packet Radio controller and protocol. Why this development was doubled up on at that late date is unknown, however it is the root cause of the problems of standardisation that are now surfacing.

There appear to be two differing approaches to Amateur Packet Radio:

The Canadian approach as developed and championed by Doug Lockhart VE7APU has much in its favour: The software is readily available, it runs on a popular microprocessor which matches the instruction set of the popular 8080/Z80 family and it is an experimental medium where enthusiasts are developing new techniques steadily.

On the other hand there is the American AX.25 protocol. This is best described in relation to the TAPR controller. In this unit the hardware uses the Motorola 6809 chip. While this is an excellent processor, it is not well accepted by the amateur computing community and there is little expertise in writing code to run on it. This code has not been made available to the public, and as such it can not be further developed. It is believed that it was written on another computer entirely and "moved" across to the TAPR hardware. This again makes it very difficult to develop new protocols.

It is appropriate to view the activity in the two camps to gain further insight into the entire situation.

The Digital Committee meeting at ARRL Headquarters will be submitting the AX.25 document to the ARRL board of directors for their approval. The Vancouver protocol was not likewise submitted as the committee members felt that there must be one and only one protocol approved in order to present a stable picture of Amateur Packet Radio to manufacturers of equipment. It was also felt that the Committee would be disbanded and funds withdrawn if they did not either come up with any recommended protocol or with more than one. The Vancouver V2 protocol was not rejected because of any technical reasons, but mainly because it did not have widespread use. This was done even though one of the creators of the AX.25 protocol, Harold Price, described it thus. *"There is currently a necessary kludge in AX.25 called digipeating which is a very demented level three feature."*

As there is still much debate about the merits of the AX.25 protocol it seems regrettable that it is being prematurely cast in concrete. There is also recent news that the TAPR board and software are being turned over to commercial concerns. The price will be going up to over $US500 for the commercially produced board. If the kits continue to be available they will still cost approximately $A400 to get into Australia.

It is fair to say that much of the American effort appears to be aimed at appliance operators.

The Canadian camp is not as large or as active in a marketing sense as the Americans, however they typify an entirely different approach.

In 1979 the Canadian objective was to technically develop Amateur Packet Radio to eventually become as good as, or better than commercial communication systems. They advocated the use of better techniques in order to develop a superior system.

The Canadians have attempted to remain flexible and not lock themselves into a standard, because they feel that there is still a long way to go to get to the best system. They developed the Vancouver protocol which was the first Amateur Packet Radio protocol and they developed the hardware upon which to run it. This combination was put into service and tested over time. As Packet Radio has developed, areas in both designs have been highlighted as places where developments in the technology can be made. The hardware was found to be a basically sound design, however some of the components used can now be replaced with more modern parts that perform the same functions better. The protocol has also been evaluated and has now grown to become the Vancouver II protocol — V2 for short.

It is regrettable that this situation of two competing standards should have developed within amateur radio, however it's no use crying over spilt milk. What is happening in the rest of the world should serve as a warning to us here in Australia.

It is essential that one standard be decided upon and that all reasonable efforts be made to ensure that this standard be adhered to in the interests of sensible standardisation of Australian Amateur Packet Radio.

As there are at present only two official Packet Radio organisations in this country (The Sydney Amateur Digital Communications Group and The Melbourne Packet Radio Group) the unpleasantly controversial task of proposing a standard falls upon us.

In the area of hardware we do not believe that either group has achieved all that might be done. The TAPR board is compact, however it is more expensive and uses an unpopular processor for which it is very difficult to develop software. The Vancouver unit is based on two circuit boards, uses four voltage supplies and is bulky.

We jointly propose a hardware standard that is based on the Vancouver groups choice of the 8085 processor and the Intel 8273 HDLC chip as this allows users of the popular CP/M computer systems to write code for this combination. We would like to see development of this hardware in the areas of component density, single voltage supply, low power consumption, better memory subsystems, greater availability and cost under $200. This combination of features will allow development of Packet Radio into all but the most esoteric of areas and make it available to virtually all amateurs.

In order to be able to further develop the protocols it is essential that the protocol initially adopted have its programmes available to the public, and that it be a reasonably advanced starting point that is as much in keeping with the International Organisation for Standardisation seven layer Packet Communications Standard as is possible. We commend the Vancouver V2 protocol as satisfying the above requirements and we jointly propose it.

The above proposals will ensure a level of standardisation that will create the most stimulating environment for Australian Packet Radio. They are sufficiently stringent to restrict the uncontrolled development that is characterising the rest of the world, while also being flexible enough to ensure that development of newer and better protocols will not be hindered unnecessarily.

We propose the above as the best possible guarantee that Australian Packet Radio will continue to be an experimental service in the best traditions of amateur radio.

Should you have any enquiries please address them to: *Sydney — SADCG, PO Box 231, French's Forest, NSW 2086.*

or

Melbourne — David Furst, VK3YDF. Of the Melbourne Packet Radio Group. C/O 131 Church Street, Hawthorn. Vic 3122. Bus: (03) 819 4855.

AR

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Amateur Electronic Imports, P.O. Box 160, Kogarah (02)547 1467
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Rivercom, 9 Copeland St, Wagga Wagga (069)21 2125
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Linear Electronics, 14 Trailwood Dve, Woodville 409 1272

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Amateurs Paradise, 142 Castle Hill Drive, Nerang (075)58 2293
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Trade Wind Sailing, 115 Tenth Ave, Railway Estate (077)72 4021

VICTORIA
Eastern Communications, 168 Elgar Rd, Box Hill South (03)288 3107
GFS Electronics, 17 McKeon Rd, Mitcham (03)873 3777
Power Point Electronics, 69 Canterbury Rd, E. Camberwell (03)836 7634
Codlin Communications, 84 Albert St, Moe (051)27 4516
Wecam, 11 Maimesbury St, Wendouree (053)39 2808
Ansonic Electronics, P.O. Box 2115, Port Fairy (055)68 1134
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Freq	Call sign	Location
50 005	H44HIR	Honiara
50.008	JA2IGY	Mie
50.020	GB3SIX	Anglesey
50.109	JD1YAA	Japan
50.945	ZS1SIX	South Africa
51.020	ZL1UHF	Mount Climie
52.033	P29SIX	New Guinea
52 100	ZK2SIX	Niue
52 150	VK0CK	Macquarie Island
52.200	VK8VF	Darwin
52.250	ZL2VHM	Manawatu
52.300	VK5RPH	Perth
52 310	ZL3MHF	Hornby
52 320	VK6RTT	Carnarvon
52 325	VK2RHV	Newcastle
52.350	VK6RTU	Kalgoorlie
52.370	VK7RST	Hobart
52.420	VK2RSY	Sydney
52.425	VK2RGB	Gunnedah
52.440	VK4RTL	Townsville
52.450	VK5VF	Mount Lofty
52.465	VK6RTW	Albany
52.470	VK7RNT	Launceston
52 490	ZL2SIX	Blenheim
52 510	ZL2MHF	Upper Hutt
144.019	VK6RBS	Busselton
144.420	VK2RSY	Sydney
144.465	VK6RTW	Albany
144 480	VK8VF	Darwin
144 550	VK5RSE	Mount Gambier
144.600	VK6RTT	Carnarvon
144.800	VK5VF	Mount Lofty
145.000	VK6RPH	Perth
147.400	VK2RCW	Sydney
432.057	VK6RBS	Busselton
432.410	VK6RTT	Carnarvon
432.420	VK2RSY	Sydney
432 425	VK3RMB	Ballarat
432 440	VK4RBB	Brisbane
1296.171	VK6RBS	Busselton

Thanks to a telephone call from Joe VK7JG, I was alerted to the fact that for some reason I had dropped out of the listing their Launceston beacon on 52.470. On looking at my list I found some others had also been missed and would be so for two issues unfortunately. Corrections have been made and those involved VK2RGB, VK4RTL, VK6RTW and VK7RNT have all been re-instated. My apologies for any heartburnings or other problems this omission may have caused. They are at least back in time for the usual Es period this summer!

On the subject of beacons, I have received a letter from Bruce VK6CX, who is the secretary of the West Australian VHF Group Inc, confirming the change of callsign of the existing Perth beacons from VK6RTV to VK6RPH. In addition he reports two additional beacons located in Perth to be added to the list, both with the callsign VK6RPR and located on 432.140 and 1296.42 MHz respectively. I expect to receive further advice when they are operating.

Bob Sutton ZK2RS on Niue Island reports in August "Break-In" that the present beacon ZK2SIX on 52.100 is attached to a 243.8 metre long rhombic which is 24.38 metres high! Eventually he hopes to have some other omni-directional device attached to the beacon. However, he says the life of the beacon is "in the lap of the god's"' as he will be leaving the island in November or December and will bring it back to ZL if he cannot be assured it will be maintained and operated properly. We can only hope arrangements can be made for the beacon to continue to operate from that much sought after island.

NEWS FROM THE SOUTH

There will be many six metre operators in Australia, New Zealand and other areas who will be pleased to learn there exists a further opportunity, this summer, to work VK0CK on Macquarie Island. David has informed me he has been granted an extension to his tour of duty there and this will take him through to February or March depending on the arrival of the supply ship.

In the light of his success on Christmas Day in 1983 when he worked a whole string of stations on six metres, and on several other occasions after, to a lesser extent, it seems very likely he will respond and make every effort to provide as many stations with a contact as he can. With this in mind, all operators are requested to limit their contacts with David to an exchange of signal reports and so allow as many as possible to share in this rare country. Operators who made contact last year particularly should very strictly limit their airtime with him and leave the period mainly for those not so fortunate.

Additionally, there is a possibility of six metre activity from the Mawson Base on the Antarctic Continent this summer. Mark VK5AVQ will be serving a term there and hopes to be able to take six metre equipment with him. At least he is hoping to again actuate the VK0MA beacon but probably on a frequency better than the former 53.100! Read this column next month for the latest information on this possible area of operation. Bear in mind however, that it will be much more difficult than working David on Macquarie Island, it is a long way further away and an exceedingly cold area, and one wonders just how much Es may be available down there. Time will tell. Also, Mawson is much further around towards the south west, actually is more south of Africa, so consult your special directional maps for this one!

VK5LP will act as QSL Manager for Mark on the same basis as that for David VK0CK. The only requirement is a card plus a self addressed stamped envelope of standard size for Australian amateurs. Overseas amateurs one IRC for surface mail or two IRC for airmail return, again preferably with a self addressed envelope. It's not that I am too mean to provide an envelope, but it saves a lot of writing if a large shipment of cards arrives at any one time!

TERRESTRIAL DX RECORDS *

6 metres	JA5HTP/6 and PY5BAB	12394.8 miles
	11th March, 1982	19947.5 km
2 metres	14EAT and ZS3B	4903 miles
	31st March, 1979	7890 km
1¼ metres	KP4EOR and LU7DJZ	3670 miles
	9th March, 1983	5806 km
70 cm	KH6IAA/KH6 and KD6R	2552 miles
	28th July, 1980	4106 km
23 cm	N6CA/6 and KH6HME	2471 miles
	24th June, 1984	3977 km
13 cm	VK6WG and VK5QR	1170 miles
	17th January, 1978	1883 km
9 cm	ZL2ARW/P and ZL2AQE/P	339 miles
	6th March, 1983	545 km
5 cm	K5FUD and K5PJR	267 miles
	20th September, 1977	430 km
3 cm	15SNY/EA9 and 10YLI/IT0	1033 miles
	18th July, 1983	1663 km
1.24 cm	I4BER/I4CHY and IW3EHQ/I3SDY	180 miles
	25th April, 1984	289 km

* as of 1st July, 1984.

I am indebted to Bill Tynan W3XO and "The World Above 50 MHz" in September 1984 "QST" for the above information which has been researched by Bill. Included in the page of information are a number of interesting facts and I am sure readers of "Amateur Radio" would like to read them too.

Bill says "It is emphasised these records are terrestrial (non-EME) and are judged only on the shortest distance between the two stations on the earth's surface without regard to the distance involved in the propogational path.

"The six metre record remains with JA5HTP and PY5BAB, who set out to work the antipodes (points on opposite sides of the earth from one another) and came within a few miles of doing just that. The distance that appeared in the July 1983 Record Box was 12 433 miles, or 20 008 km. This was calculated using a TI-SR52 hand calculator programme. I have always felt that this programme produced reasonably accurate results, as the answers appeared to compare favourably with the calculations of others as well as with several check cases.

"Recently, however, I received a letter from JARL External Affairs Manager Yutaka Kasahara JA1CLN, inquiring about how the distance was calculated and questioning the exact distance. One limitation of the programme I have been using is that it assumes a perfectly spherical earth, when in reality our globe is somewhat flattened at the poles. It also makes some other simplifications which, coupled with this deficiency, I now learn, provides less-than-adequate results for distance approaching halfway around the world.

"As a result of Mr Kasahara's question, I set out to get a more accurate calculation of the JA5HTP to PY5BAB distance. To this end, I asked an acquaintance at a local research establishment to calculate it with a more sophisticated programme. He used the US Naval Observatory's Arc Length Determination Programme, and came up with a distance of 12 394.8 miles or 19 947.5 km — certainly a significant difference from the one I had calculated. Incidentally, the Naval Observatory programme yields a distance halfway around the earth at the equator of 12 450.4 miles (20 032.7 km), and 12 408.8 miles (19 965.8 km) at the poles, the difference of course being due to the aforementioned polar flattening.

"1984 provides us with a new 23 cm record. The old mark set by VK6KZ/P and VK5MC has finally succumbed to the California/Hawaii duct first made famous by W6NLZ and KH6UK. Details of the record breaking contact are as follows:

"After several days of 2 metre and 70 cm propogation across the 2500 miles of open water, the 1296 MHz KH6HME beacon, which N6CA had built and shipped to Hawaii several years ago, began to be heard in the Los Angeles basis. Whereupon N6CA contacted the beacon keeper at his QTH in Hilo via landline, and Paul immediately set out for the site some 2.4 km up on Mauna Loa. The record-breaking two-way between the two occurred at 0035 UTC 24th June, with N6CA operating portable 335.28 metres above sea level on the Palos Verdes Peninsula, which juts into the Pacific a few miles southwest of Los Angeles. Equipment at N6CA consisted of 100 watts to a 44 element loop yagi. At the Hawaiian end, the rig ran 20 watts to an array of 25 element loop yagis stacked four high. Both ends employed 1.5dB noise figure pre-amps. The signal from KH6HME was also received by WB6ESQ, but he could not be heard at the Hawaiian end. Thus, one of the world's best and longest tropo ducting paths has been responsible for yet another world-above-50MHz DX record."

Readers will recall I featured this record breaking contact as a Stop Press item in the September issue of this column, and the above now confirms that information and provides some details of what took place.

OPERATING IN G LAND

A postcard from Doug VK4AIZ in the UK and now operating with a G4 licence says he is really enjoying the long break there, meeting many VHF types and operating on two metres in a small way. So far he has worked eight countries without much trouble, including Yugoslavia on Es. He is suitably impressed with the value of the 'squares' system in promoting and maintaining VHF operation, and hopes it will be received sufficiently well in VK for it to become universally used. Further on the UK scene, he is fascinated how, for example, VHF operators choose to specialise in only one or two specialised modes, eg: MS or aurora. He is very envious of the level of activity there when compared with the Australian scene . . .

thanks for the card Doug.

MOONBOUNCE REPORT

From "The Propagator" . . . A computer system has now been installed at VK2AMW for tracking the dish in Hour Angle, and has been connected to the Hour Angle position sensing potentiometer, and it should now be possible to position the dish and have it track the moon in Hour Angle movement without the need to first sight the moon.

EME tests were conducted over the weekend of 18th/19th August. Contact was made with HB0BM/P in Liechcenstein with an "M" report. The schedule with G3LTF and F2TU on 19/8 turned out to be after moonset at the VK end. F2TU had been copied the day before with "0" reports both ways, and another contact eventuated with HB0BM/P on 19/8. A sched with ZL3AAD did not produce any contacts.

A fault developed in the transmitter exciter after the tests and was found to be deterioration of the 3CX100A driver tube, resulting in the output being down to seventy per cent of normal, with its remaining life unpredictable. It is hoped that the installation of low loss coax between the exciter and power amplifier will help to compensate for the drop in driver stage output. Lyle VK2ALU and the rest of the gang would be pleased to hear from anyone who has a good quality 3CX100A tube lying around doing nothing, and which they don't want. It would be given a good home in the EME exciter!

OTHER NEWS

Bob VK5ZRO went for a bit of a trip recently and decided to load a few items of gear on board for travelling contacts. He took along equipment which allowed him to run 80 watts on 52 MHz, 120 watts and 144 MHz, 120 watts on 432 MHz, and 14 watts on 1296 MHz. He also had the car AM/FM radio for good measure!

Bob's trip to Woomera did not bring a lot of joy. He found very few signals to work on any of the four bands. He tried 1296 back to Adelaide but nothing heard. Whyalla to Adelaide still nothing on 1296, although 2 metres was good. However, on the return journey he established contact with Sid VK5ME on 1296 from Locheil, which is north of Port Wakefield and about 130 km, and was able to maintain contact at varying signal levels all the way home. Bob was using his alpha slot antenna and Sid his 1.219 metre dish. Both were running 10 watts, so it appears 1296 mobile is a definite reality.

During September there was an odd JA contact around on 6 metres. Also noted on 9/9 JAs were into Perth. Also received a report that Graham VK8GB had been working into Japan on 2 metres, and that he had also worked Carnarvon.

During the telephone conversation with Joe VK7JG re the Launceston beacon, he mentioned there were two other beacons which could interest us from the Indian area. One is VU2AID on 50.110 which appears to be continuous, and 4S7EA which operates on Sundays on 50.120 and is therefore probably a manned beacon.

The Ross Hull Memorial Contest starts next month. I was approached by the Federal Contest Manager for any suggestions for improvements to the Contest and made several suggestions including changes to the scoring table. Whether or not these are acted upon time will tell. Similar suggestions have been made in the past to other Contest Managers with little effect. It is realised it is a very difficult contest to make it fair competition for everyone because of the vastness of our country but it seems a pity to have it so arranged that it is virtually handed to metropolitan stations who can work across town on a daily basis for extremely high scores per contact.

New Zealand amateurs have their Field Day Contest on Saturday and Sunday 12th and 13th December, and includes all bands from 6 metres upwards. Also, if you are interested, there is a 6 metres only contest on 17th November, so there could be a little more activity than usual from across the Tasman.

News is generally scarce this month. No letters to hand. Maybe with the warmer weather we will see an increase in activity. Closing with the thought for the month: *"The ultimate test of whether you possess a sense of humour is your reaction when someone tells you you don't."* 73. The Voice in the Hills. **AR**

welcome here

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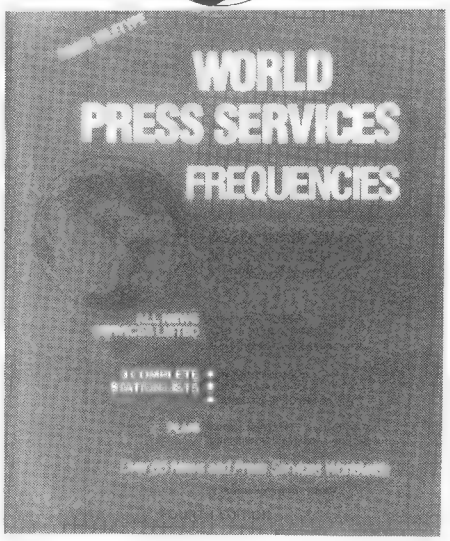
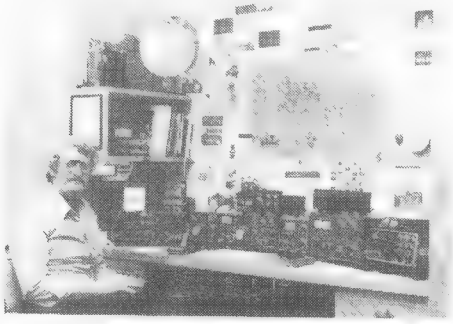


Available shortly from your Divisional Offices or from Magpubs.

Recommended Retail Price . . . $8.95 plus postage.

AMATEUR RADIO MUSEUM & TELEGRAPHIC KEY COLLECTION

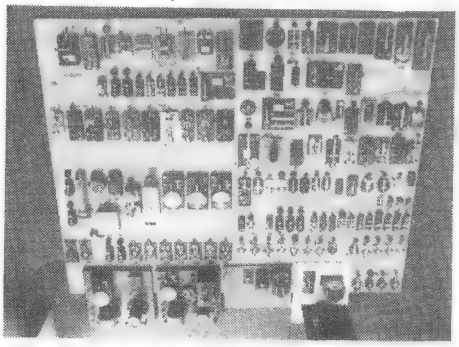
Because there was no Museum of Amateur Radio Equipment in South Africa, three years ago Julius ZS6AF, decided to start one at his amateur store in the centre of Johannesburg, to enable young amateurs to see what gear was used by old timers, and the old timers to reminisce on the good old days. The Museum also plays an important role for those amateurs who like to dispose of or display items that they no longer use, that also clutter up their shacks.



Julius ZS6AF

Some interesting units on display are Hallicrafter Sky Buddy, Harvey Wells Transmitter, National HRO Jr, BBC Headphones, Acorn tubes to handmade transmitting tubes, QSL cards, old photographs and so on.

The most exciting part of the Museum is the collection of Telegraphic (Morse) Keys. This is a collection of keys, modern, old handmade, presentation, etc. There are approximately 145 varieties so far, and the collection is still growing. The aim is to have at least 500 different types of keys.



All items in the Museum are donated or loaned by amateurs. The call sign and name of the respective amateur is labelled on each item and numbered, and a filing system of the history of the particular item is recorded.

The visitor's register has recorded more than 1000 visitors from places as far as Australia, New Zealand, England, USA, Germany, Qatar, Belgium, Japan, etc. **AR**

contributed by Alan Shawsmith VK4SS

* * *

The game of life is not so much sending CW but receiving it as well.

* * *

The older an amateur gets, the faster he could copy it as a boy.

* * *

A poor antenna is like playing tennis with the net down.

* * *

We have found out that an ego is one thing that can grow without nourishment.

from Collector & Emitter — March 1984

AWARDS

Hugh Spence, VK6FS
FEDERAL AWARDS MANAGER
44 Mosaic Street, Shelley, WA 6155

The day after Hugh posted these notes he admitted himself to hospital — very ill. Hugh passed away nine days later. Hugh was a great stalwart of the WIA and an eager helper to any amateur in need. He became Awards Manager after the 1984 Federal Convention and during this short time he put his heart and soul into performing the position with excellence.

Hugh will be sadly missed.

Turn to Obituaries for a detailed tribute to Hugh.

TD-EA-CW AWARD

The Spanish Radioamateurs Union (URE), through its local group in Villarreal, establishes the TD-EA-CW Award, accordng to the following rules:

1. *The TD-EA-CW Award is available to all Amateur Radio Operators and SWLs throughout the world who are licensed with any IARU member country.*
2. *Two-way simplex contacts with the nine EA districts must be confirmed. (9 contacts)*
3. *Only contacts after 1st January, 1976 are acceptable.*
4. *All authorised amateur HF bands may be used.*
5. *All contacts must be in the 'CW' mode only.*
6. *Contacts made through repeaters, satellites and other similar means of communication are not valid.*
7. *Contacts from or with mobile stations are not valid.*
8. *All stations must be contacted from the same DX country.*
9. *Only one callsign may be used by the claimant station. (ie They mean a Novice call and upgraded full call cannot be mixed.)*
10. *Other TD-EA-CW Awards available as endorsement stickers:*
    5B-TD-EA-CW (9 districts x 5 bands = 45 contacts)
    160 TD-EA-CW (9 districts on 160 m band)
11. *Send LOG details certified by Awards Manager plus $3 to:* Delegacion Local de URE, La Mura 67, Villarreal, (Castellon) ESPANA.

NOTE Decisions of the TD-EA-CW Award Committee regarding interpretation of the rules shall be final.

ZONE 29 AWARD

The Zone 29 Award is offered by the West Australian Division of the Wireless Institute of Australia to all licensed radio amateurs and SWLs throughout the world. To qualify for this award the following conditions must be satisfied.

1. *Establishment of two-way communication with any twenty five different amateur stations located in Zone 29. Only contacts made after 0800 UTC on 1st January, 1952 are valid.*
2. *The total of twenty five different stations may be obtained by operation on one or more of the authorised amateur bands as applicable at the time of the claimed contact. Cross-band contacts are not accepted.*
3. *Any type of emission as permitted by the local licensing authorities at the time of the claimed contact may be used. Cross-mode contacts will not be accepted.*
4. *Minimum acceptable exchange of reports for the Award shall be:*
   Phone: Readability 3 and Strength 3.
   CW: Readability 3 and Strength 3 Tone 8.
5. *Applications containing multi-band and multi-mode valid contacts will be accepted but the Award will be issued with no endorsement.*
6. *Special endorsements, as listed hereunder, will be displayed on the Award certificate, where applicable, when all valid contacts fulfill the following conditions:*
   (a) Single Band — Multi mode.
   (b) Single Band — All Phone.
   (c) Single Band — All CW.
   (d) All Phone — Multi band.
   (e) All CW — Multi band.
   (f) Other special endorsements as considered to be outstanding and unique.
7. *SWL applications will be accepted and the Award certificate issued, with appropriate endorsements as applicable, when all conditions listed above are complied with.*
8. *QSL cards are not required as proof of valid contacts but the application must show that the log extracts have been examined and verified by two other radio amateurs or the Awards Manager of the applicants IARU affiliated radio society. A simple declaration that the applicant's station has conformed to all licensing regulations as related to his operation is mandatory.*
9. *The fee for the Award shall be $1 (Aust) or five IRCs for overseas stations.*
10. *Essential information required will include: Callsign of station worked/heard, Band (MHz) and Mode used, Date and Time (UTC), RST received, RST given. Standard-form application sheets are available at no cost from the address below or applicant may use his own as desired.*
11. *Applications should be addressed to:* Awards Manager, Zone 29 Award, WIA (VK6 Div'n), PO Box 10, West Perth, WA 6005.

TAMAR VALLEY AWARD

The Northern Branch of the Wireless Institute of Australia, Tasmanian Division has instituted a new award.

The purpose of this award is to encourage all amateurs to make contact with amateurs resident in the Tamar Valley Region of Northern Tasmania. Short wave listeners may also qualify for the award in the usual manner.

You may qualify for the award in any of the following sections and you may qualify for more than one award.

SECTION 1 — OPEN: By the use of any combination of bands and modes available to the applicant. (Split banding is permitted but cross banding is not except between NAOCP and ALOCP holders.)

SECTION 2 — HF ONLY: By the use of any combination of bands up to 30 MHz available to the applicant.

SECTION 3 — VHF/UHF/SHF: As for Section 2 but above 30 MHz.

SECTION 4 — SINGLE BAND: Any one band of those available.

SECTION 5 — SINGLE MODE: Any one of those available.

SECTION 6 — ALL NOVICE: Contact with Novices only (Including 'K' calls below 30 MHz.)

SECTION 7 — REPEATER: Via in-band repeaters.

SECTION 8 — SATELLITE: Via amateur satellites. Cross banding to HF allowed if permitted under licence terms.

SECTION 9 — SWL'ing: For Short Wave Listeners.

Section 4 and 5 may be combined with other sections.

Applicants must earn twenty points to qualify for the award. Stations can only be worked once for each award.

Points are earned as follows:

CALL AREA	ON HF	ON VHF/UHF/SHF
Tasmania	1 point (20 stations)	2 points (10 stations)
Australia	2 points (10 stations)	4 points (5 stations)
All others	4 points (5 stations)	10 points (2 stations)

On HF applicants must work these stations as follows:

FROM TASMANIA: At least five stations resident in the Greater Launceston area and at least one station resident in each of at least five of the surrounding municipalities (shires) of Beaconsfield, Evandale, George Town, Longford, Lilydale, St Leonards and Westbury.

Each station will signify their municipality (shire) during the contact.

FROM AUSTRALIA: At least three stations resident in the Greater Launceston area and at least one station resident in each of any three municipalities (shires).

FROM ALL OTHERS: At least two stations resident in the Greater Launceston area and at least one station resident in any other municipality (shire).

On VHF/UHF/SHF etc applicants must work these stations as follows:

From Tasmania: As for 'Australia' above.

From Australia: As for 'all others' above.

From All Others: Any two stations in the designated area.

Applications in the form of log extracts should show the applicant's Name, Callsign, Section applied for, Callsign of the station contacted, Date, Time, Band or frequency, Mode and Municipality.

Claims are to be signed by the applicant only. Spot checks may be made with stations in VK7 for confirmation. QSL CARDS ARE NOT REQUIRED.

Only contacts made after 1st September, 1984 are eligible as claims and applications for the award should be made to the Awards Manager, PO Box 168, Launceston, Tas 7250.

A fee of $2 or five IRCs for VKs or $4 or ten IRCs for overseas applications should accompany the claim.

On looking back over the records of the various awards issued by the WIA it would seem that some do not appear to be very popular with Australian amateurs. To date the number of Certificates issued, in the various categories, is as follows:

WAVKCA		1268
DXCC	Phone	328
DXCC	Open	225
WAS (VHF)		155
DXCC	CW	124
VHFCC		115
HAVKCA (SWL)		80
WAVKCA (VHF)		18
DXCC	RTTY	2

The WAVKCA is our most popular award, especially with overseas amateurs, and the Japanese are well in the lead. I wonder if there is any particular reason why more VK amateurs do not try for these certificates. Is it that they are too difficult? At least I will admit that they are a little more difficult than some overseas awards that appear to be issued to collect IRCs. One particular country asks 65 IRCs for their Five Band Certificates. So let us look as what is required

WAVKCA	*22 Contacts for overseas countries. 77 for VK, and we do not need the cards.*
DXCC	*100 of course in each mode claimed.*
WAS (VHF)	*8 contacts verified.*
VHFCC	*100 of course of which 70 must be VK.*
HAVKCA	*22 verified reports.*
WAVKCA (VHF)	*22 verified contacts.*

Now what is so difficult about all that? Certificates are issued 'FREE' to members of the WIA, who must send the address label from their latest issue of Amateur Radio.

Harking back to my notes in August AR re the Declaration required to be made and signed if cards are not forwarded to the FAM for checking.

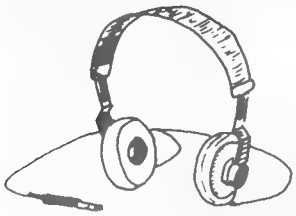
A recent application for DXCC arrived with the Declaration correctly signed by two amateurs. The following 17 calls have been extracted from the 100+ on the list:

UA1ZDX	*claimed as*	*Murmansk, Franz Josef*
UK0FAD	*" "*	*Nevelsk*
UW0FR	*" "*	*Sakalin Is*
UK0ZAA	*" "*	*Kamchatka*
VY1DV	*" "*	*Whitehorse, Yukon*
CY7BKO		
XO7CC		
KM2X	*" "*	*Midway*
T3DB	*" "*	*Tarawa, Gilbert Is*
T30BL	*" "*	*Kiribati*
CE3EEO	*" "*	*Chile*
XQ5BIB	*" "*	*Chile (special)*
KO7RS	*" "*	*BERU Contest*
ZL1BIZ	*" "*	*Auckland*
ZM3AGI	*" "*	*RD Contest*
F6ARC	*" "*	*France*
TO6IJA	*" "*	*Serge, Annecy*

No prize if offered for the correct answer to just how many different countries are in the above seventeen callsigns, certainly not seventeen. Admittedly some of these are using special prefix's but a quick glance at the 'Table of Allocation of International Call Sign Series' in the Australian Call Book would very quickly show what country had been allocated 'VY', 'CY', 'XO', 'XQ', 'TO' etc.

Heaven forbid that we ever reach the stage that QSL cards are no longer required for DXCC, only log book extracts. Enough stirring for this month and I would like a 5A and a TT8, good hunting and 73 de Hugh, VK6FS.

AR



LISTENING AROUND

Joe Baker, VK2BJX
Box 2121, Mildura, Vic 3500

Here I sit in front of this typewriter on a cold and blustery Monday 17th September, and a few words about the weather might not be out of place. Sunraysia (the general name for this area on both sides of the river) is a place where you can get roasted in midsummer, or frozen in winter.

On the side of a hill where I am, we get the full force of the icy cold winds that are now blowing along the river, and it's at these times that my thoughts return to other times and warmer climes while serving as an Army Sig in the Northern Territory, and later Morotai Island.

As a student at St Columbas College, Springwood, just prior to World War Two, I read a book called "We of the Never Never" by Mrs Aeneas Gunn, and thereby came my first introduction to the Northern Territory, little realising that I would ever have the opportunity of going there. In fact at college, I became more interested in reading about the Territory and Territorians (1902, of which Mrs Gunn wrote) than I was in learning about Caesars Gallic Wars or Cicero (in Latin, of course), geometry, trigonometry, algebra, Greek or French. The original "We of the Never Never" that I had fell apart long ago, and so it is, that being able to buy a second copy a few days ago in Mildura, I am renewing old acquaintances with the Maluka (the station boss), Cheon (the station cook), Goggle-Eye (the aboriginal king), "Fizza" the mailman and a collection of others that go to make up this magnificent Australian classic.

Mrs Gunn only spent about a year in the Northern Territory in 1902 yet was able to capture so wonderfully the character and spirit of the Territorians of those times. My trip to the Northern Territory was forty two years later with 600 other Army Sigs that were transferred via Melbourne, Adelaide, Terowie and the Alice (on the old "Ghan") to Adelaide River, and the 67 Mile. The trip took us a fortnight, via staging camps, and the first semi-trailers that I had ever seen, which had been imported from America, took us from the Alice to Birdum, or Larrimah.

But it is of the 67 Mile that I want to write today, because "The Gossiping Wire" (The Overland Telegraph Line) of which Mrs Gunn wrote so long before, passed right through the middle of our camp at the 67 Mile (near Coomalie RAAF strip). And it was here that an incident which I'm not likely to forget took place.

One particular night a mate and myself had been rostered for Picket Duty — a sort of armed guard who patrols the camp area at night, tending to camp fires for the mess, and in general seeing that all was well. We were rostered for duty commencing at 11 pm My mate had been on other duties earlier, and I was aware that he was very tired, so I suggested that he get some rest while I would take care of things by myself. *"What if the Orderly Officer comes around and asks where I am?"* he said. I told him not to worry that I would pitch the Orderly Officer some sort of tale. So off he went to get much needed rest, leaving me to guard the whole camp.

After raiding the Officers Mess to get myself bread, coffee and other goodies I retired to the interior of a "Blitz Wagon" which was parked under a tree, to listen to the BBC on a Number 11 set. All was well, and periodically I left the Blitz Wagon to talk to a civilian who was manning a switchboard on the OTC line which, passing through our camp, connected Darwin with the Alice and all points south. As the NT was under martial law at that time, he was one of the only two civilians in the NT, the other being at Pine Creek, who looked after an aircraft beacon.

Somewhere about 4 am, I heard a voice call out *"Switch out that light"*. I did not know where the voice came from but assumed that it was someone awake in the tent lines, being bothered by light from the Blitz Wagon escaping via the open back door. I closed the door, but left the roof door open to keep the Wagon cool. The light hence escaped heavenwards.

I had heard the sound of aircraft about this time and assumed that it was the RAAF on one of their nightly raids from Coomalie strip, and paid little attention to it. At breakfast time the camp was abuzz with rumours that the Japanese had been overhead during the night. I had known nothing of this earlier, so I went to the civilian on duty at the OTC switchboard and asked him if he had known anything about it.

The civilian said yes, that he had heard about the raid, and that he had got word down the line from Darwin, as the raiders (the Japanese Zeros) had headed south from there. *"You mean to tell me that you had advance warning before the aircraft flew overhead, that you knew they were coming, yet you did nothing about warning me, and me with a light from the Blitz Wagon shining skywards. Don't you realise that had the planes seen the light from the Blitz Wagon, we could all be in 'Kingdom Come' by now?"*

That night after the bombers had passed overhead, they went down near Adelaide River. My brother Frank (who died in Mildura last year) was on guard duty at an RAAF strip near Adelaide River, later told me that he heard the bomb bay doors open as the Zeros unleashed their load of destruction near where the amulances were kept at Adelaide River, and later they went on down to Fenton Strip — named after one of the NTs early Flying Doctors.

That's my story about the Northern Territory this time. There will be more, and in the meanwhile as for me here in freezing Buronga, my thoughts return to those other years in warmer climes as I again visit the Top End with those delightful folks of another era in "We of the Never Never".

73 to all from Joe VK2BJX

AR

Joe wishes to thank all who have been kind enough to meet with him on air to chat about "Listening Around".

QSP

TELECOM PLANS WALKIE-TALKIE PHONES

Australia is to get a new high technology "cellular" national mobile telephone service which will provide users with personal portable hand-held phones.

Telecom has called worldwide tenders for equipment after making a final decision to introduce the service expected to be available from 1986, starting with Sydney and then progressively introduced in other centres.

Tender documents specify phones which can be used in vehicles, or taken from the vehicle to become self contained hand-held phones.

Telecom said in the late 1980s a new cellular network would provide coverage of populated areas and along major highways.

The service could also be used for data transmission and enhanced services such as three-way conference calls, waiting call diversion, and a telephone answering service.

Telecom said the cellular system would not replace the existing mobile telephone service.

This operates in Melbourne, Sydney, The Gold Coast and Perth, and to be extended into Adelaide, Canberra, Geelong, and The Sunshine Coast in the near future.

Contributed by Jim Linton VK3PC

AR

NATIONAL EMC ADVISORY SERVICE

Tony Tregale VK3QQ
FEDERAL EMC CO-ORDINATOR
38 Wattle Drive, Watsonia, Vic. 3087

CORONA DISCHARGE POWER LINE INTERFERENCE

High voltage lines sometimes exhibit corona discharge at supporting insulators, sharp edges, or points along the wire. The discharge is due to ionization of the air in the vicinity of the high voltage conductor or equipment. Ionization is an energy transformation process, producing visible light, broadband electromagnetic energy, and ozone.

The broadband electromagnetic energy produced by corona discharge varies with frequency and weather conditions, being more pronounced in damp conditions. The ozone produced by the corona helps to encourage and increase spark energy be damaging the surfaces of the hardware.

Fortunately, there are relatively few amateurs who suffer this form of PLI, which is mainly associated with lines and equipment above 66 kV. Notwithstanding, it is felt readers may find this article by Dr E Skomal of the Van Nostrand Reinhold Company to be most enlightening in respect of this complex and little understood phenomena.

Corona discharge is also a threshold transition process that requires that a minimum potential gradient in the vicinity of a charged object be exceeded before the effect is manifest. The charged object need not be an electrical conductor; dielectric objects are quite capable of producing radiating corona discharges, although the threshold electric field will not be identical. Neither is the occurrence of corona discharge restricted to alternating-current, as opposed to direct-current, power facilities; both will exhibit corona-produced radio noise for either positive or negative polarity. However, the electric field thresholds for initiating noise-generating corona discharges are unequal for the two polarities.

Unlike gap-discharge breakdown, which is always associated with the presence of two oppositely charged surfaces, corona discharge requires but a single charged object at sufficiently high potential. either positive or negative. As the potential of the corona source point increases, the high-mobility free electrons in the vicinity are accelerated by the local electric field either toward or away from the point. When the source point is negatively charged with respect to the zero-potential reference surface, electron movement away from the point affects, through inelastic collisions with the air molecules, the creation of excited molecules, positive ions, and electrons. The molecular excitations emit ionizing photons, which produce additional free electrons, and, together with those created by inelastic collisions, generate an avalanche current if the electron-loss rates from the processes of attachment, diffusion, and recombination are exceeded by the electron-production rate. The net electron-production rate is a direct function of the potential gradient at the source point. Onset of charge avalanching coincides with corona-threshold attainment and initiation of both radio-noise and visible-spectrum emissions. Visible radiation, which is bluish, is confined to the immediate vicinity of the source.

During the avalanche process, positive ions created by electron in-elastic impacts and photoionization of the air migrate toward the source point, impinge upon the surface, and create by secondary emission additional electrons and positive ions. The electrons produced by these processes are driven from a negative source, and, through attachment to oxygen molecules, they create a negative-space charge cloud whose centre lies somewhat more remote from the source than the average inception point of the electron avalanche. The results are a reduction of the electric field in the vicinity of the source, at approximately 1 mm, and quenching of the current avalanche and all electromagnetic radiation within a few nsec of its inception. Diffusion of the negative-space charge cloud from the vicinity of the source and migration of the positive ions to the source clears the space and permits the potential gradient to increase until it again attains the critical threshold level forming another current avalanche. Electro-magnetic pulse durations of a few nanseconds arising therefrom create a radio spectrum extending into the UHF band.

Features of the corona source point that influence the radio emission level are:

1. *its dimension, which jointly with the applied potential determines the local electric field strength existing in the air*
2. *the composition of the source, which determines the secondary emission coefficient for positive ions*
3. *the source-point surface condition; namely the level and type of surface contamination that also affects the secondary emission coefficient.*

Accumulated experimental evidence has established that negatively charged points on power facilities manifest corona-discharge radio-noise onset at lower operating voltage gradients than do positively potential points. On alternating-current power facilities, corona discharge occurs on the negative half-cycle of the fundamental wave at a lower potential gradient than on the positive half-cycle. The reason that negative corona noise acts as a lesser disturbance to wireless reception than positive corona emissions arises from the appreciably smaller radiated intensity of the former, which is directly ascribable to the confinement of the current avalanche to the immediate vicinity of the source — ie within approximately 1 mm. Whenever the source point is elongated and protrudes from the negatively charged surface, negative-corona radio emissions are susceptible to dramatic increases in intensity. Such condition may occur, for example, when the point is formed from foreign material attached to a metal conductor. This condition is rarely encountered on power facilities leading to the generalisation that positive corona is of primary concern and negative corona may be ignored as a cause of radio noise on generators, transformers, and power lines.

The onset of a current avalanche in the vicinity of a positively charged point occurs at potential gradients larger than those associated with negative corona. For clean metallic surfaces, the positive corona-discharge threshold will exceed the negative-threshold electric field by fifty per cent. When the state of the metallic surface changes as with the development of localised irregularities, the positive threshold gradient decreases, approaching the value of the negative threshold gradient in the limit of high imperfection density. Free electrons formed by the avalanche are drawn toward the positively charged source and, unlike the situation for negative corona, are not driven from the source into the surrounding air to form a low-mobility negative space charge cloud that quenches the avalanche. An immediate consequence of this difference is a marked increase in (1) the spatial extension of the avalanche discharge, (2) the duration of the avalanche, (3) the number of branching paths that diverge from the source point, and (4) the total avalanche current density. Visible radiation (reddish orange) produced by charge recombination and atomic excitations outlines the avalanche traces, revealing a treelike pattern emanating and spreading from the source. Spatial expansion of the positive corona is limited to the region in which the potential gradient is above the avalanche threshold and may extend several inches beyond the surface.

The radiation produced by the discharge is proportional to the current moment — ie the product of the current density and the length of the avalanche filament, attaining a value that is several orders of magnitude greater for positive than for negative corona. Positive corona may be classified by the visible appearance of the glow discharge region into plume or streamer and corona glow. Plume or streamer corona whose spatial extension beyond the source point may attain a length of four inches on extra-high-voltage (EHV) facilities is, for alternating-current systems, the predominant radio-noise source. Under fair weather conditions, the sources of plumes and streamers may be filamentary dielectrics such as vegetable particles or insects and elongated metallic bosses on various facilities.

When moisture is present in an attached dielectric particle (eg an insect), positive corona pluming is inhibited until the moisture has been removed by negative corona excitation. Plume suppression derives from moisture-induced negative-corona generation, which produces a negative-space charge cloud in the vicinity of the source. Low mobility of the negative space charge prevents its dissipation during the positive half-cycle of the voltage, and, unless diffusion is augmented by strong air movement, the negative cloud affects a reduction of the potential gradient about the source point sufficient to prevent electron avalanching. Ultimately, desiccation of the particle or the commencement of air movement with wind currents of 5 to 15 mile/hr enable the formation of positive corona pluming on the power facility.

Elongated metallic protrusions will produce positive corona emission on new, unweathered surfaces. The chemical-physical processes associated with metallic-surface weathering normally stabilise within six months of installation and inhibit streamer formation in quiet air. Negative corona thereafter remains as the only noise source unless air movement intensifies, removing the plume-suppressing negative-space charge from the vicinity of the boss.

The lower-intensity positive-corona noise sources in fair weather are not evidenced by visible plumes or streamers but rather by a low-intensity glow. These arise from high-potential-point weathering caused by windblown abrasives, such as dirt and dust particles striking and adhering to the surfaces.

During foul weather, EHV power facilities may display a large increase in radio noise. This increased level arises from the presence of both negative and positive coronas in alternating-current systems, the latter producing the highest-intensity electromagnetic radiation.

When negative corona occurs independently of positive corona, the general radio-noise level is low. On EHV transmission lines, negative corona during foul weather emits a low-intensity bluish glow visible at night at the conductor surface. Glow discharge occurs in the presence of a small amount of moisture derived from light rain or the presence of ice. The associated radio-noise levels are low for EHV transmission lines, comparable to the corona-noise emissions existing during fair weather conditions on

somewhat imperfect lines.

Foul-weather radio-noise maxima always accompany the presence of a positive corona, which is visibly manifest as streamers and plumes emanating from high-potential points on the power facilities. The meteorological conditions productive of high-intensity positive-corona radio noise on EHV lines are in order of decreasing intensity: snow, rain, melting icicles, and sleet. The snowfall-induced radio-noise maxima observed for EHV transmission lines exceed the mimimum fair-weather corona level by approximately 40 dB and the maximum fair-weather line corona radio noise by 20 dB for frequencies from 0.5 to 1 MHz. Ambient temperature plays an important role in snow-induced radio-noise emissions. With an air temperature near -70° C plume generation is inhibited, and the radio-noise levels are reduced by crystallisation of the water. When the air temperature rises to -30° C to -10° C, in the presence of snowfall, positive plumes occur, resulting in a radio-noise level that attains a maximum value under moderate wind conditions, 10 to 15 MPH. Wind velocities within this range are able to remove the negative-corona space-charge cloud from the vicinity of the generating particles, increasing the local potential gradient and thus the noise emission.

Precipitation in the form of rain produces, on EHV transmission-line conductors, corona plumes and concurrently radio noise, which is only slightly less than for snowfall. As rain commences on a dry line conductor, water drops passing through the high-field region near the conductor initiate a gas-discharge breakdown, the threshold of which is reduced by the high dielectric susceptibility of the water. Simultaneously, some drops will impinge upon the cable to produce positive corona plumes and associated radio interference. The resulting peak levels of the radio noise may exceed minimum fair-weather noise by 25 dB, and maximum fair-weather noise by 5 dB, and maximum fair-weather particle corona noise by from 5 to 10 dB. With continuing rainfall, lines become thoroughly wetted, and impingement plumes cease. Gradually, moisture accumulates as a film enclosing the conductors. Forced by gravity, the water film migrates down the catenary to the nadir where it forms droplets and nuclei for spray plumes, which generate intense radio noise approaching levels of 40 dB above the minimum fair-weather corona value. Plume corona and intense radio noise persist in the vicinity of the catenary nadir after rain cessation and remain for as long as water droplets cling to a conductor. After drying, radio noise is often lower than before the rain. This occurrence is attributed to the removal of dirt and dust particles, sources of positive corona, which had accumulated on the conductor. Evidence developed from studies on EHV direct-current test lines presents a behavior distinctly opposite to AC lines. Positive-polarity high-potential gradient conductors, which under dry-line fair-weather conditions display a high level of radiated corona noise, are observed to manifest a substantial drop in interference level in excess of 15 dB, at the onset of rain. When the rain ceases and the line has dried, corona noise levels return to their initial high value, for reasons not presently understood.

If air-temperature changes occurring during or after precipitation follow a profile that produces freezing and then slow-melting (or melting, freezing, and remelting in instances of snowfall), water drops are formed and attach to the tips of short icicles approximately 2 mm in length. The high-potential points initiate intense positive corona plumes and noise emissions approximately 25 dB greater than minimum fair-weather corona noise, if wind speeds of 5 to 15 mph are present to dissipate the space charge.

AR

POWER LINE INTERFERENCE SURVEY

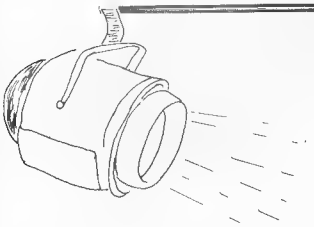
The National EMC Advisory Service would like to hear from any Amateur Radio Operator, Short Wave Listener or other interested person who is suffering excessively high "power line" noise (PLI) to reception and has been unsuccessful in obtaining remedial action from the authorities.

We require as much information as possible; for example, Does it affect your TV? Frequencies affected, Level of noise ('S' meter reading if possible), Distance of antenna system from nearest HV (11000-66000V) power line or equipment.

Please direct your report to:- *PLI Survey, P.O. Box 300, Caulfield South, 3162.*

AR

SPOTLIGHT ON SWLing



Robin Harwood, VK7RH
5 Helen Street, Launceston, Tas 7250

Well, 1984 is rapidly drawing to a close. With the warmer weather now here, I will be spending my time listening more in the evening hours. This ties in with the best propagation on the high frequency bands being in the evening hours. During our winter months, we had disappointing propagation on the higher bands, although the lower frequencies, such as the tropical bands from 2 to 6 MHz, were very good. Unfortunately these will be practically unusable because of the high static levels from electrical storms. Don't forget that the D84 period commences as from the 4th November, when stations alter their frequencies for seasonal variation. These frequencies should remain stable through till the first Sunday in March.

NEW RECEIVER

Recently, I purchased an R70 receiver to add to my shack. I am very satisfied so far by its performance, being superior to the FRG7 that I was using previously. I am especially pleased with the Notch Filter together wth the Pass Band Tuning, which minimises effectively interference from heterodynes and/or adjacent channel splatter with the aid of both of these functions. Yet I have been disappointed with the Noise Blanker, particularly in coping with Power Line Hash as well as sundry electrical appliances around the house. Yet in the Wide position, the Blanker was sometimes effective against "Woodpecker" pulses.

Another plus for me is the second VFO. This assists me greatly in comparing parallel outlets or utility services working duplex. The differing dial tuning rates are extremely accurate and it is easier now to measure frequencies than previously. It is a pleasure to turn the set on, after some hours, to find it on the exact frequency with no apparent drift. It is, at present, the pride of place in my shack. For more extensive reviews of the R70, you will find these readily available elsewhere and it isn't my intention here to add to their number.

RE-ARRANGED PROGRAMMING

And now on to some other news. In October, the BBC World Service altered their programming so that the news will be heard every hour on the hour, whether in the form of a summary or a full bulletin. In order to facilitate this, some re-arrangement of programmes has been made. For example, "Monitor" — the programme about what other broadcasters are saying about current events — has been moved to 0945 UTC from 1015 on Thursdays. And "Outlook", which takes a look at the lighter side of current events has been moved from 1515 to 1400 UTC. This programme is on weekdays.

LIVE POLLING

I am sure that you are no doubt aware that Americans go to the polls to elect their president on the 6th November. Members of federal, state and local governments are elected at the same time. The Voice of America will be carrying a live coverage in English over their extensive network of transmitters throughout the world as soon as the polls close until it becomes clear who has won. A simultaneous release in Russian will also be aired. The date is, of course, of significance to Australians, being Melbourne Cup Day.

SHIPPING LISTS

On the 2nd November, the BBC World Service will be carrying a programme on "Lloyd's List". This is an international daily newspaper you won't find at your suburban newsagents, for it is available only on subscription. This paper is required reading for thousands of business leaders, especialy within the City of London. It contains news and developments on international shipping matters.

It started in the Seventeenth Century in Lloyd's Coffee House and has expanded into a unique insurance market where almost anything can be insured. "Lloyd's List" reflects the changing face of commerce over the centuries into an international daily specialist newspaper only available by subscription. Malcolm Billings gives us the background on this unique body at 0830 UTC on 2nd November.

BACK-ON-AIR

We note that the Radio Australia site in Darwin has at last been re-activated with two transmitters. It was extensively destroyed on Christmas Day 1974 in Cyclone Tracy. It may have made frequency changes in the D84 period, so I will not give these here, suffice to say the Chinese transmission on 7.135 MHz at 0930 UTC is from Darwin and not from the Shepparton, Vic site. The Darwin site will, presumably, boost significantly RA's signal into East Asia and the Pacific using two 250 kW senders.

RELAY BASE?

I believe also that the British Government has been negotiating with the Seychelles Government to possibly establish a relay base on this tiny Indian Ocean island republic. The proposed site would serve central and eastern African regions. I do not know if the BBC will still go ahead with the proposed Hong Kong Relay now, after agreement has been reached with the Chinese government on the proposed handover to China of the Crown Colony in 1997. The site was going to serve China and Japan. As well, the VOA is modernising their facilities worldwide. Their relay facilities in Sri Lanka will be among the first to be modernised. This base serves the Indian subcontinent. Also the DW senders now in Sri Lanka should be operational shortly.

Well, that is all for this month. Until next time, the best of 73 and good listening! — Robin VK7RH.

AR

CONTESTS

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER

P.O. Box 1234, GPO, Adelaide, SA 5001.

CONTEST CALENDAR

NOVEMBER

10 ALARA Contest. Combined Phone and CW (Rules AR Oct '84)

24 — 25 CQ WW DX CW Contest (Rules AR Oct '84)

DECEMBER

1 — 2 ARRL 160 metre Contest

8 — 9 ARRL 10 metre Contest

1st Dec 1984 to 7th Jan 1985. Ross Hull Memorial Contest (Rules this issue.)

JANUARY

Ross Hull Memorial Contest continues to finish 7th Jan

1 UBA SWL Competition, 1985 commences (Rules this issue)

12 40 Metre World SSB Championship Contest

13 75 Metre World SSB Championship Contest

19 — 20 160 Metre World SSB Championship Contest

26 15 Metre World SSB Championship Contest

27 20 Metre World SSB Championship Contest

FEBRUARY.

23 RTTY World Championship Contest

ROSS HULL MEMORIAL VHF CONTEST RULES, 1984.

Objects Australian amateurs will endeavour to contact as many other amateurs as possible.

Period From 0001 UTC on 1st December, 1984 to 2400 UTC on 7th January, 1985.

Exchange RS(T) plus a three figure serial number starting at 001 and increasing by one for each contact. When 999 is reached as start is made again from 001.

Bands All amateur bands above 30 MHz. Six metre contacts valid only between 52 and 54 MHz. Cross-band contacts are not permitted. Contacts via active repeaters and translators cannot score.

Operator Single operator only. One transmission only at one time.

Contacts Two contacts per UTC day per band with each station, provided 10 hours have elapsed since the previous contact.

Duration (a) 7 UTC days — not necessarily consecutive. (b) 2 UTC days — consecutive.

Sections (1) Phone. (AM, SSB, ATV, SSTV.) (2) CW. (CW and RTTY.) (3) 52 and 144 MHz only. All modes. (4) Receiving. Any mode.

Log Sheet It is desirable that logs covering the complete period of the contest be submitted for cross checking purposes. Photo copies are acceptable. The following details must be shown. Time and Date in UTC, Band, Emission, Station worked, RST No Sent, RST No Received, Points, Bonus. Each page must be totalled at the bottom.

Front Sheet A front sheet must be attached to the log entries showing the following information in this order. Section, Call Sign, List of 7 best UTC days with daily score and bonus points added to provide a 7 Day Total, list of best 2 UTC days with daily score and bonus points and 2 Day Total. If operating only on 52 MHz and 144 MHz — 7 best UTC Days with daily score and bonus points added to provide a 7 Day Total. Declaration: I certify that I have operated in accordance with the rules and spirit of the contest. Name, address, signature and date.

SCORING TABLE — AUSTRALIA.

Distance	Band	52	144	432	576	1296	2304 up
Up to 100 km		1	1	2	5	5	10
101 — 200 km		2	2	4	10	10	20
201 — 400 km		5	3	6	15	20	30
401 — 800 km		10	10	15	20	30	40
801 — 2500 km		10	20	30	40	50	60
Over 2500 km		20	40	50	60	70	80

BONUS

(a) For each new call area in Australia, including own call area, 10 points once only per band per UTC Day.

(b) For each prefix worked outside of Australia, 10 points once only per band per day.

(c) For each band used 576 MHz and above add 10 points once per UTC Day.

(d) *VK6 ONLY* For all contacts with VK stations except VK6 and VK0 add 5 points. To VK0 and ZL contacts add 10 points. No bonus for any other call areas eg JA etc.

OVERSEAS STATIONS Stations outside Australian call areas will endeavour to contact as many Australian stations as possible.

Scoring for such contacts will be as follows: 52 MHz — 50 points. 144 MHz — 100 points. 432 MHz — 200 points. Should any contacts by overseas entrants take place on frequencies higher than 432 MHz the Contest Manager will allocate special points to such contacts based on the distance scoring table as for Australia together with a ratio adjustment.

AWARDS A perpetual trophy is awarded annually for competition between members of the Wireless Institute of Australia. The winners name is inscribed on the trophy and he also receives a suitable certificate. The entrant with the highest score in either the 7 day or 2 day division will be the winner and his Division will hold the trophy for one year. Certificates will be awarded to the highest scorer in both the 2 day and 7 day divisions. A winner of a 7 day certificate cannot be awarded a 2 day certificate as well. Overseas entrants will be awarded certificates on the same basis, one for each call area. IN ADDITION certificates will be awarded for the highest 7 day score in each state for those operating on 52 and 144 MHz only. (It is possible that this may eventually be expanded to include the 432 MHz band.)

SUBMISSION OF LOGS Entries are to be forwarded to the Federal Contest Manager, WIA, GPO Box 1234, Adelaide, SA 5001. Entries must be recieved no later than 20th February, 1985. Please endorse the outside of the envelope 'Ross Hull Memorial Contest'.

RECEIVING SECTION Logs for the receiving section must show the same information as for a transmitting log except for the second number exchanged. If both stations participating in a contact are heard, both may be claimed but must be listed as separate entries on the log. Scoring will be as for a transmitting log. Any scoring contacts may be logged with no limit to the number of times that one station can be logged.

DISQUALIFICATION The Contest Manager may disqualify logs which are illegible or improperly set out or do not conform to the rules laid down. See the General Disqualifications Criteria as published in 'Amateur Radio' for August 1984. Any station observed during the contest as constantly departing from the generally accepted codes of operating ethics may also be disqualified.

COMMENT ON CHANGED RULES FOR THE ROSS HULL MEMORIAL CONTEST

The scoring table required examination and change from that offered previously. Many of the bands provided hundreds of points for a contact and such an approach seems very artificial. Consider the 1296 MHz band with 75 points for contacts of 100 to 200 km. With the present state of the art contacts within that range are not difficult and simply provide opportunities for massive scoring for a few stations favourably placed in metropolitan or near metropolitan areas.

The points scoring system shown appears to be fair and reasonable. It recognises the effort required to work stations on the higher bands by being generous with points and gives a bonus score as well. It also recognises that there is little difference in effort required to work stations up to 200 km on 52 or 144 MHz. However, it is harder to work up to 400 km on 52 MHz than it is on 144 MHz and the scoring reflects this. Between 400 and 800 km Sporadic E helps the 52 MHz band so it seems to even out again. From 800 km onwards such propogation really helps the 52 MHz band. It can also help on 144 MHz but not nearly so often. Tropospheric scatter contacts on 144 MHz up to nearly 2000 km are not that uncommon.

The bonus system has been chosen such as to privide incentives in a number of different ways. It takes account of long distance overseas contacts, multi-band operation, extra prefixes and as well, general and constant operation if band conditions are mediocre. The separate approach to bonus points for the VK6 area seems to be realistic.

You will note that encouragement is given also to those who can only operate on the more common VHF bands of 6 and 2 metres. Most stations probably fall into this category but are unable to compete with the specialist VHF/UHF multi-band stations. It is hoped that the addition of the two band category this year may help promote more interest in this contest.

Finally an important word regarding use of the 6 metre band. It is essential that NO operating for this contest take place within the 50.000 to 50.150 MHz segment of the band Such operation could well lead to the flouting of the present regulations governing the use of that portion of the band. What we have so far gained could well be jeopardised if the right thing is not done during this interim period in our fight for open use of the band on an international basis. Sporadic E contacts around VK and ZL are quite satisfactory on 52 MHz and it would not do to have 50 MHz cluttered up with such contacts spoiling the DX possibilities as is happening in the USA and Japan.

I would like to acknowledge the most valuable comments and advice provided by Eric Jamieson VK5LP, who is very well known in VHF circles and the writer of our VHF/UHF column in this magazine, for guidance in preparation of the rules for this years Ross Hull Memorial Contest. Naturally, I will also be most interested in your own individual comments on this contest as well as on any other contest matters.

UBA SWL COMPETITION 1985

Well here is one contest specifically aimed at our SWL fraternity and certainly one to keep you busy on a long term basis. I wish you well in your short wave listening and trust you obtain much enjoyment from that activity.

Next month I will provide details of the World Championship series of contests sponsored by the '73' Magazine. I also hope to be able to bring to you the results of the current competition for the Contest Champion Trophy now that the VK/ZL Contest results have been published.

UBA SWL COMPETITION 1985

1 This SWL Competition is opened to anyone in the world member of an organisation recognised by the IARU. The intention of this contest is to log during the year 1985, from 1st January, 1985, 0000 UTC to 31st December, 1985, 2400 UTC, as many DXCC countries as possible on 5 bands.
   The countries are according to the ARRL DXCC list.
   The operating bands are 28, 21, 14, 7, and 3.5 MHz.

2 *Points and multiplier:*
   — Each country heard counts once one point on each band.
   — Each country heard counts once as a multiplier.
   The final score is the total of countries heard on all bands added together multiplies with the number of different countries heard.

3 There will be three categories and only single-operators are allowed. It is allowed to enter,

participate in more than one category at the same time, but no mixed mode participations are allowed. The categories are:

1 Phone
2 CW
3 RTTY

4 *Logs:*
To participate, the use of a special prepared log of fourteen pages is obliged. Entrances on other logs will be refused. The use of the log excludes double logging as the countries counting for the contest are already marked on it alphabetically by their normal prefix, with place for one call and date per band.
The log can be obtained from the contest-manager for four IRCs.
National societies who wish to distribute the log themselves among their members can obtain one log free on request.
Stations logged must have made a QSO and the callsigns must be shown in full. Dubious calls will be refused.
A summary sheet will show: SWL No or call, name, address, equipment and the calculation of the result.

5 To enter the contest, an interim result LOG, must be sent to the contest manager three times during the year. Postmarked no later than 1st March, 1st June and 1st September. These interim results must contain the obtained points until that date detailed per band.
The full log must be sent in postmarked no later than 20th January, 1986.

6 Certificates of merit will be awarded by the SWL Committee of the UBA and its decision will be final.
All participants will receive at least a commerative QSL via their organisation. Participants who wish to receive the interim results, the final result and the QSL direct are asked to enclose one IRC with their interim results or log. Comments on the contest are kindly awaited.

7 Logs, interim results and all correspondance regarding the competition to the UBA *SWL* Contest Manager: Marc DOMEN ONL 6945, Gebr Blommestraat 14, B-2200 Antwerpen-Borgerhout, Belgium.

Portable operation of an amateur radio station can be a great deal of fun almost any time, away on holidays, WICEN exercises etc, and not least during a Field Day Contest.

Most national amateur radio societies of any note usually conduct such an event on at least an annual basis and Australia is no exception to this. We have the John Moyle Memorial Field Day Contest which has for some time been held in February each year. (See previous comments in this column discussing a possible date change for this event.) You may ask well-informed operators from the 1950 era who John Moyle was and just what he accomplished. One of the most basic reasons field day contests are run is that, apart from the fun they provide, they offer an opportunity to set up and operate an amateur station under temporary conditions which may be met in an emergency situation. It is of course policy for the WIA to encourage operators to train themselves to develop the skills needed to cope with emergencies, and sponsoring the Field Day helps towards this requirement.

One of the most important facets contributing to a successful portable operation is planning and preparation. First sit down and try and picture your portable situation, then make up a list of items, including the major units of equipment, which you think you should have at your field day station. Start with a basic station and then add to the list spares such as additional connectors, repair kit, extra feedlines, guy wire, cord for tying and supporting, spare microphone, fuses, multi-meter, flashlight, spare bulbs and batteries, pens and pencils, note pads, lead-lights both AC and DC, VSWR meters, power outlet boards, masting/tubing, extra hookup and antenna wire, insulating tape . . . the list could go on and on. Having made up your list collect all these items together in suitable containers such as plastic bags, cardboard boxes etc. It is also necessary to work out some way to pack the items into your conveyance to allow easy access to them when needed. It might also be just as well if you don't have a good memory to make a handy reference list to show which items are in which box. (Then don't forget where you put the list. Hi.)

One pair of items which I find virtually indispensable for portable operation is a very large lead fishing sinker and a reel of very strong cord. The cord I prefer is nylon venetian blind type. One word of caution though. When using a line and weight of this nature to throw over such supports as tree branches make sure that you do not let the line run through your hand immediately after it is thrown otherwise you may receive a very nasty burn.

Another item preferred is a good clip-board or even several. It is a good way to handle such papers as log sheets, check sheets and notepads to avoid them being blown all over the place by every gust of wind

A very important consideration is food and drink. The amount you take is dependent on the duration of your stay in the field, the likely weather conditions you might encounter, number of people in your party etc. If the weather is very hot it is most necessary that you have a really adequate supply of suitable fluids. Without trying to dampen your enthusiasm on the social side I would counsel you against the use of alcoholic drinks in extreme heat as even though they may seem refreshing their use can so easily backfire as the alcoholic content actually increases your thirst as well as reducing the body capability for cooling thus leaving you as a prime candidate for heat exhaustion. Don't just take my word for it, ask your local doctor. Therefore leave your social imbibing of this nature until late in the day, if it is necessary, when the cooler evening time approaches. The range of provisions I will leave up to your imagination as it can be very wide and varied, especially if you are taking along a couple of spare cooks, barbecue etc.

Another important aspect is your ability and the capability of your setup to handle all weather conditions, wind, rain, cold and heat. In some locations you can get away with just a table next to your vehicle in the open. In some places the heat might be intolerable and in others whilst comfortable during the day it could become extremely chilly during the night. It may thus be advisable to take a good tent with you. This can also be useful if your site is such that a sudden weather change could isolate it, forcing you to remain for some additional time. It is also very worthwhile to keep in mind the problems of repelling insects such as flies, ants, moths and other nasty beasties. Many of these are attracted by the lights needed for operation at night. I have heard of one trick which consists of providing one very bright incandescent light some distance away from the station location so as to attract most of the insects and a softer "fluoro" type light for the operator, but I cannot vouch for the effectiveness of this approach. Obviously the usual type repellent sprays should be on hand.

Your station may be either simple or very elaborate as in the case of a multi-operator club station with crank-up towers and beams etc. It still pays to put as much thought as you can into the layout and ways of achieving maximum effectiveness in just the same manner you would treat your home station. Quick changing of equipments one with another, selection of antennas and the like can pay dividends. You might like to re-read my previous comments on this in my writeup on the home station.

As part of the station setting up you should consider using as much as you can of naturally available facilities. This can include orientating wire antennas to take advantage of strategically placed trees, use of boulders to secure ends of antenna support lines and use of shelter from the elements In the desert near Woomera I found a large water tank about 20 feet high with a ladder up the side. There was just nothing else higher than a couple of feet for miles around. I used the top of the ladder to support the ends of dipoles which sloped down towards the ground with the ends weighted in place by stones. The car was parked close to the east side of the tank to catch the shade from early afternoon onwards and bottles of drink were lowered into the water tank with strings tied about their necks to allow retrieval. One year I made a bad mistake in my enthusiasm to have a cold drink available as I filled a thermos flask with both drink and many ice cubes before leaving for the site. I learned that ice cubes bouncing around inside such a flask soon cause it to break after journeying on a route strewn with stones and in and out of creek beds

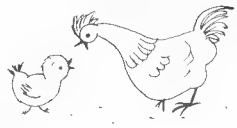
One most useful item to have is a power generator. This can be either petrol or diesel with the advantage that the latter will not provide ignition interference problems. The choice on this is up to you. It pays to locate the generator some distance away from the operating position for several reasons. Distance reduces noise problems both acoustic and electrical as well as obviating unpleasant exhaust gas effects. Be sure and clear the area around the generator for quite some metres of any inflammable material Peg the generator into position so that it cannot creep with vibration. Make sure that the frame of the unit is properly earthed. Store extra fuel out of the sun if possible and be careful opening fuel cans in the heat as the contents can expand very rapidly. DO NOT refuel the generator whilst it is still running. SWITCH OFF and even allow the unit to cool down if necessary.

Make sure also that the radio equipment is properly earthed and if you can run to an earth leakage detector as part of your power outlet box so much the better. Make sure that your extension lead from generator to equipment is in good condition and that it is a heavy duty type.

The use of other power supplies might be considered. It is Federal Policy of the WIA that the use of alternative power sources should be encouraged. I would very much appreciate your comments on this score. Such power sources could include solar, wind, pedal generators, chemical etc. In the ARRL Field Day Contest bonus points are awarded to stations which make a minimum of five contest contacts, amongst their other contacts, using 'Natural Power'. *So what do you think about that? Should we also include such a rule?*

Just a few final points. If you want to set up your station on private property make sure that you first of all have permission from the legitimate owner. Make sure that wherever you operate you leave a good impression as a responsible citizen by clearing away all debris and rubbish, including cigarette butts and restoring everything to as near a condition as you found the site prior to your operation Select your operating times with good reason. It is no good going out and setting up a station which can only operate on the 80 metre band and expect to do most of your operating during the day. It is some time since I heard much about the National Parks Award. It may well be that portable operation from places included for this award could create some additional interest.

Also in the ARRL Field Day Contest there is a section for Home Stations which are run on emergency power. I feel that this is in line with the aim to encourage amateurs to prepare for emergencies. Do you think such a section should be added to our rules? Cheerio and 73 for now. **AR**



NOTICE

ALL copy for inclusion in January 1985 Amateur Radio must arrive at Box 300, Caulfield South, 3162 no later than midday 13th November. It is imperative that contributors adhere to this early deadline for publication, which is necessary due to the Christmas Holiday season.

AMSAT AUSTRALIA

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR

INFORMATION NETS

AMSAT AUSTRALIA
Control: VK5AGR
Amateur Checkin: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.680 MHz Summer: 7.064 MHz

AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305 MHz

AMSAT SW PACIFIC
Control: W6CG
2200 UTC Saturday
21.280/28.878 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGEMENTS

Contributions this month are from Bob VK3ZBB, Graham VK5AGR and AMSAT Telemail

OSCAR-10 RTTY TELEMETRY

On the 3rd September at 1345UTC the RTTY telemetry on board OSCAR-10 was transmitted for the first time. The following telemetry block was recorded on the 9th September and is presented as an example for the explanation that is to follow.

NOTE!

In order to save magazine space redundant carriage return/line feeds and a row of spaces have been deleted from the block presented

The RTTY blocks are termed Z-Blocks and the letter z is the first character transmitted.

TELEMETRY BLOCK 9th SEPTEMBER 1984

```
Z HI THIS IS AMSAT OSCAR-10
06.15.22 2443

000D      .0080     020E
 64   7    0    0    5  233    1
230   0  146  136  206    0  154   69  212   54
145  11    0   34  143   56  122   40  129    0
 10  24  130   86    8    0  126   82  113    0
126  70  112  129  150   13   79  147  148   12
 61 140  151  100  247  138  145  110  198  135
124   9  179  142  134  132   10  139  140   10
 HI  HI  DE  AO  10  QTC  001
AT MA 13 AGC NO
NEW OPERATING SCHEDULE IS EFFECTIVE
OCT AND SEPT TRANSPONDER ON IS BETWEEN MA 32 AND 190
MODE L EVERY DAY MA 100 TO 117 EXCEPT SUNDAY
NORMAL OPERATION WILL RESUME AFTER ECLIPSE SEASON
AO  10  HI  HI  Z  HI.  THIS IS AMSAT OSCAR-10
06 17 37  2443

000D      0080      020E
 64   7    0    0    5  233    1
239   0  146  137  206    0  156   68  212   54
145  11    0   34  144   55  119   40  129   12
 20  24  130   89   11    2  126   84  113    0
127  13  111  129  150   13   79  148  148   90
192 140  151   13  247  138  145  111  198  135
123  13   15  142  134  132   10  139  141   10
 HI  HI  DE  AO  10  QTC  002
NEW BEACON OPERATIONS ARE EFFECTIVE NOW
ON THE HOUR TEL AND QTC
ON THE HOUR PLUS 30 ORBITAL ELEMENTS STARTING SOON
ON THE HOUR PLUS 15 AND 45
RTTY TEL AND QTCS
AO  10  HI  HI
```

DECODING OF RTTY TELEMETRY

The relevant formulae for extracting the various space-craft parameters from the telemetry are published in the AMSAT-UK OSCAR-10 Handbook The following explanations and listing of formulae has been extracted from that handbook by Graham VK5AGR, and re-formatted for presentation in this column. Thanks Graham.

With reference to the Telemetry Block for 9th September, 1984. Line 1 is the Header/Identifier Line, commencing with the letter Z.

Z HI. THIS IS AMSAT OSCAR-10

Line 2 is the Time/Day Information

06.15.22 2443

hh.mm.ss dddd d=decimal numbers

The Time is UTC

The Day Number is referenced to 1st January, 1978 which is called Day Zero (0).

ie 9th September 1984 = (6 * 365)+253 = Day 2443

Line 3 is the Safety Information Word/Transponder Status Command Number

.000D .0080 .020E

This line is telemetred as

hhhh hhhh hhhh where h is a hexadecimal digit

(I shall not enter into an explanation at this stage on the various computer codes in use, however if you wish to pursue the interpretation of the lines containing hexadecimal digits, ask one of your computing friends for an explanation or better still obtain a copy of any beginners computing handbook and unravel the codes yourself.)

Safety Information Word

ie 000D is 13 Decimal which equates to binary bits (15 thru 0) as 0000,0000,0000,1101 = > Bits 3,2 and 0 are set.

Bit 0	Undefined
1	Liquid ignition unit 0 - power off
2	Undefined
3	Arm plug present
4	Undefined
5	)Memory soft error counter
6	)Memory soft error counter
7	)Memory soft error counter
8	He Pressure status (1 = low pressure)
9	Separation power (1 - separated)
10	Motor valve status (1 open)
11	Fire keys status (1 motor armed)
12	)Not Used
13	)Not Used
14	)Not Used
15	)Not Used

The Safety Information Word is now basically a redundant feature except for the memory error counter.

Transponder status

ie 0080 which is 128 Decimal and equates to bits 0000,0000,1000,0000 = > Bit 7 is set and indicates that the transponder was off at the time that the block was telemetred.

0	General Beacon OFF keying bit
1	General Beacon FSK MARK + 170 Hz shift
2	DPSK OFF usually 0 except when convolutionally encoding
3	Engineering Beacon ON
4)	PSK on General Beacon 00 no PSK
5)	01 ranging 10 Eng Beacon source 11 illegal
6	Low power transponder
7	Passband OFF

Command number

ie 020E which is 526 Decimal. This number increments by one every time a command is uploaded by a command station.

Line 4 Blank (Deleted in sample block)

Line 5 Seven Control Channels MUX0 thru MUX6

64 7 0 0 5 233 1

All channel outputs are decimal numbers

Channel 0 — Earth sensor sensitivity threshold

ie 64 equates to binary bits — 0100,0000 = > Bit 6 - 1 thus telemetering value = 1.2 volts.

Bit 0	20 mV
1	37 mV
2	75 mV
3	150 mV
4	300 mV
5	600 mV
6	1.2 V
7	2.4 V

Channel 1 — Antenna

ie 7 equates to binary bits — 0000,0111 = > Bits 2,1,0 are set, to indicate that Hi-gain antennae were switched to 2 metre downlink, 70 cm Uplink and 24 cm Downlink.

Bit 0	1 = Hi-gain 2 m 0 Lo-gain 2 m
1	1 = Hi-gain 70 cm to B, Lo-gain 70 cm to L 0 = Hi-gain 70 cm to L, Lo-gain 70 cm to B
2	1 = Hi-gain 24 cm ON
3	1 L Transponder ON 0 B Transponder ON

Channel 2 — Motor Power Status

ie 0 to indicate OFF, as 170 ON otherwise OFF

Channel 3 — Liquid Ignition Unit

*ie 0, Burn time remaining number * 2.5 seconds*

Channel 4 — Battery Control Regulator Voltage Input

ie 5 is telemetred value.

If telem value is 0 to 127 then N - Telem value.
128 to 255 then N - Telem value -256.

For example: If Telem = 127 then N = 127
If Telem = 128 then N = -128
If Telem = 255 then N = -1

V = 29.1 V + (N * 100) mV Array voltage offset. If BCR input voltage > commanded input voltage implies positive power budget.

V = 29.1 V + (5 * 100) mV = 29.6 V

Channel 5 — Battery Control Regulator Voltage Output

ie 233 is telemetred value.

If telem value is 0 to 63 then N - Telem value.
64 to 255 then N = Telem value -256.

V = 14.98 V + (N * 20) mV Battery knee voltage offset.

Telem value - 233, N = 233 256 = -23

V = 14.98 V + (-23 * 20) mV = 14.52 V

Channel 6 — Battery Control Regulators Relays

ie 1 equates to binary bits 0000,0001 = > Bit 0 is set to indicate BCR2 is On.

Bit 0	BCR2 On
1	Aux battery connected via parallel diode
2	Aux battery connected, main disconnected

Lines 6-9 Blank (Deleted in sample block).

Lines 10-16 Telemetry Channels 0 — 59 (Line 13 is blank — also deleted from sample block).

Insert value as telemetred into formulae.

OSCAR-10 RTTY FORMULAE CHANNELS 0 — 59.

Channel	00	BCR Vin	V = (N * 150) mV
	01	L Trans Power O/P	P = (253 N)* 2/2000 Watts
	02	B Trans RX Temp	T = (N -127)/1 82 C
	03	—	
	04	Main Battery Voltage	V = (N - 10) * 75 mV (Vout — BCR)
	05	—	
	06	B Trans TX Temp	T = (N - 127)/1 82 C
	07	14 V Trans Bus Current	I = (N - 15) * 20 64 mA
	08	10 V Continuous	V = (N - 12) * 50 mV
	09	—	
	10	Internal Housekeeping Unit (IHU) Temp	T = (N - 127)/1 82 C
	11	14 V Sep Bus Current	I = (N 15) * 4 128 mA
	12	BCR Osc1 Status	>25 O K 0 not working
	13	—	
	14	BCR Temp	T = (N 127)/1 82 C
	15	10 V Continuous	I = (N - 15) * 4 128 mA
	16	BCR Osc2 Status	>25 O.K 0 = not working
	17	—	
	18	Sensor Elect Temp	T = (N - 127)/1 82 C

19	Batter Charge Current	I = (N - 15) * 10 32 mA
20	Top Sensor Voltage	N - 65 > 1 solar constant N 10 background N > 20 when sun present
21	—	
22	Main Battery 1 Temp	T (N - 127)/1.82 C
23	BCR out Current	I (N - 15) * 20 64 mA
24	Bottom Sensor Voltage as Per channel 20	
25	—	
26	Main Battery 2 Temp	T (N - 127)/1.82 C
27	BCR in Current	I - (N - 15) * 10.32 mA
28	Spin Rate N>-139 N>139	S (508/(N-116))-2 rpm S = ((139 N) * 0 8)+20 rpm
29	L Trans RX AGC (Attenuation)	A = (N - 100)> 2/189 db N>100 A 0 N < 100
30	Aux Battery Temp	T (N - 127)/1 82 C
31	Solar Panel 6 Current	I - (N - 15) * 4.128 mA
32	B Trans Power O/P	P = (200 N)> 2/2000 Watts
33	He Tank Temp	T = (N - 127)/1.82 C
34	Solar Panel 1 Temp	T = (N - 127)/1.82 C
35	Solar Panel 5 Current	I - (N - 15) * 4.128 mA
36	B Trans RX AGC	A - (N - 83)> 2/1000 dB Idles at N 83
37	L Trans TX Temp	T (N - 127)/1 82 C
38	Solar Panel 3 Temp	T (N - 127)/1 82 C
39	Solar Panel 4 Current	I = (N - 15) * 4 128 mA
40	—	
41	L Trans RX Temp	T (N - 127)/1.82 C
42	Solar Panel 5 Temp	T = (N - 127)/1.82 C
43	Solar Panel 3 Current	I = (N - 15) * 4.128 mA
44	14 V Trans Bus	V (N - 10) * 61.5 mV
45	Arm 3 Wall Temp	T (N - 127)/1 82 C
46	Top Temp	T = (N - 127)/1.82 C
47	Solar Panel 2 Current	I = (N - 15) * 4.128 mA
48	9 V B Trans	V = (N - 10) * 50 mV
49	Arm 2 Wall Temp	T - (N - 127)/1.82 C
50	Bottom Temp	T = (N - 127)/1 82 C
51	Solar Panel 1 Current	I = (N - 15) * 4.128 mA
52		
53	Arm 1 Wall Temp	T = (N - 127)/1.82 C
54	—	
55		
56	Aux Battery Voltage	V = (N - 10) * 75 mV
57	Central Support Temp	T = (N - 127)/1.82 C
58	Sensors Temp	T - (N 127)/1.82 C
59	—	

SATELLITE RETRIEVAL BY SHUTTLE

The following item was posted to AMSAT Telemail and may be of interest to readers:

Astronauts To Retrieve Satellites
By Harry F Rosenthal
Associated Press Writer
Washington (AP)

NASA announced Friday its astronauts will retrieve two $35 million communications satellites from space in November and bring them back to earth in the cargo bay of the space shuttle Discovery. The satellites were cast uselessly adrift last February by faulty rocket boosters after they were launched from the space shuttle Challenger. The space agency said it signed an agreement with Merritt Syndicates Ltd, which represents insurance underwriters, to go after the Westar 6 satellite on the flight and bring it back to earth. An agreement was reached with Merritt earlier to bring back the Palapa-B satellite. NASA will charge up to $5.5 million for the twin rescues. One retrieval would have cost Merritt $4.8 million. The insurance companies have already paid $105 million to Western Union, owner of Westar 6, and $75 million to the Government of Indonesia, owner of the Palapa satellites. Hughes Aircraft Co, manufacturer of the satellites, will refurbish them for a second shuttle launch at a cost yet to be determined. The underwriters intend to sell the satellites to a communications carrier for somewhat less than the new cost of $35 million to $40 million, hoping to recoup a few million of their $180 million loss. The satellites, which need to be at 22 300 miles altitude to be effective, were thrown into faulty low orbits because their attached rocket carriers failed. The booster rockets since then have been fixed; two satellites were launched successfully this month from the shuttle, using the same type boosters. The satellites apparently suffered little damage in the launch failure. Westar 6 and Palapa-B are orbiting the earth at 564 miles altitude, a half-world apart. By the end of this month, ground controllers will send commands to fire the satellites' small hydrogen steering jets to lower the altitude over a ten day period to 225 miles, within reach of the shuttle. Astronauts Joseph P Allen and Dale A Gardner, each a veteran of one shuttle flight, will take spacewalks in the rescue mission. Allen and Gardner probably will alternate jobs in the two attempts, which involve an astronaut donning a jet backpack, flying to the satellite and inserting a rod into the motor. Attached to the rod is a fixture which then will enable the shuttle's robot arm to latch on.

UPS AND DOWNS

Thanks to Bob VK3ZBB we have the latest list of space launch and re-entries.

PHASE-4 PROGRAMME

In the January 1985 issue I shall publish extracts of a document prepared by Kan King W3GEY on the Phase-4 Proposal. It is indeed an interesting and exciting proposal for the future.

de Colin VK5HI
AR

NOVEMBER/DECEMBER 1984 OSCAR-10 APOGEES

			APOGEE	SATELLITE CO-ORDINATES		BEAM HEADINGS SYDNEY		ADELAIDE		PERTH	
DATE	DAY #	ORBIT #	UTC HHMM:SS	LAT DEG	LONG DEG	AZ DEG	EL DEG	AZ DEG	EL DEG	AZ DEG	EL DEG
NOV 1	306	1043	1030:55	16	246	319	20	332	26	358	34
2	307	1045	0950:01	16	236	328	25	342	29	10	34
3	308	1047	0909:03	16	227	338	29	353	31	21	32
4	309	1049	0828:08	16	218	349	32	5	32	32	28
5	310	1051	0747:14	16	208	1	33	16	30	41	23
6	311	1053	0706 19	16	199	12	32	27	27	49	17
7	312	1055	0625.21	16	190	23	29	36	23	56	10
8	313	1057	0544 27	16	180	34	25	45	18	62	4
9	314	1059	0504:59	16	171	42	21	53	12		
10	315	1061	0424 04	16	162	50	15	59	5		
11	316	1063	0343 07	15	152	57	8	65	-1		
12	317	1065	0302:12	15	143	64	2				
13	318	1068	1400.48	15	309					297	4
14	319	1070	1319:54	15	299					303	11
15	320	1072	1238:59	15	290			295	-1	310	17
16	321	1074	1158.04	15	281	293	-3	301	6	318	23
17	322	1076	1117.07	15	271	298	4	307	13	327	29
18	323	1078	1036 12	15	262	305	11	315	19	337	33
19	324	1080	0955:17	15	253	312	18	324	24	349	36
20	325	1082	0914:22	15	243	320	23	333	29	1	36
21	326	1084	0833:25	14	234	329	28	344	32	14	35
22	327	1086	0752:30	14	225	340	32	356	34	25	33
23	328	1088	0711:35	14	215	352	34	8	33	35	28
24	329	1090	0632 07	14	206	4	35	19	32	44	23
25	330	1092	0551 10	14	197	16	33	30	28	52	17
26	331	1094	0510.15	14	187	27	30	40	24	59	10
27	332	1096	0429 20	14	178	37	26	48	18	65	3
28	333	1098	0348 26	14	169	46	21	56	12		
29	334	1100	0307.31	14	159	54	15	62	5		
30	335	1102	0226 33	14	150	60	8	68	-2		
DEC 1	336	1104	0145 39	13	141	66	1				
2	337	1107	1244 15	13	306					297	6
3	338	1109	1203 20	13	297					303	14
4	339	1111	1122:26	13	288			295	2	310	20
5	340	1113	1041 28	13	278	292	0	301	9	318	26
6	341	1115	1000 33	13	269	298	7	308	16	328	32
7	342	1117	0921 06	13	260	305	14	315	22	339	36
8	343	1119	0840 11	13	251	312	21	325	27	351	38
9	344	1121	0759 13	13	241	321	26	335	32	4	39
10	345	1123	0718 19	12	232	331	31	346	35	17	37

SATELLITE ACTIVITY FOR PERIOD 27TH JUNE-31ST JULY 1984

1. LAUNCHES

NUMBER	NAME	NATION	DATE OF LAUNCH	PERIOD MINS	INITIAL DATA APOGEE KM	PERIGEE KM	INCLN DEG	REMARKS
1984-067A	COSMOS 1577	USSR	27 Jun	104 9	1023	974	83	SI TM
1984-068A	COSMOS 1578	USSR	28 Jun	105	1673	296	50 7	SI TM
1984-069A	COSMOS 1587	USSR	29 Jun	89 6	281	257	65	SI TM
1984-070A	COSMOS 1580	USSR	30 Jun	—	—	—	—	
1984-071A	COSMOS 1581	USSR	3 Jul	—	—		—	
1984-072A	METEOR 2	USSR	5 Jul	104	974	954	81 5	Meteorological
1984-073A	SOYOZ T12	USSR	17 Jul	88 8	248	203	51 6	see below
1984-074A	COSMOS 1582	USSR	19 Jul	89 5	308	227	82 4	SI TM
1984-075A	COSMOS 1583	USSR	24 Jul	90.1	388	209	72 9	SI TM
1984-076A	COSMOS 1584	USSR	27 Jul	88 8	268	193	82 4	SI TM
1984-077A	COSMOS 1585	USSR	31 Jul					

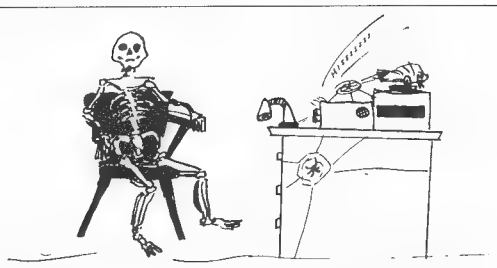
84-073A SOYOZ T12 is a manned spacecraft with Cosmonauts Djanibekov, Savitskaja and Volk aboard.

2. RETURNS

During the period the following satellites decayed or were recovered

1984-050A	COSMOS 1558	8 Jul
1984-051A	Progress 22	15 Jul
1984-070A	COSMOS 1580	13 Jul
1984-073A	SOYOZ T12	29 Jul

— together with 32 other objects



VK2EBM waiting for a come-back on 20 metres!!!

—VK2EBM

VK3 WIA NOTES

Jim Linton, VK3PC
DIVISIONAL PRESIDENT
VK3 DIVISION

REPEATERS — WHO PAYS?

Taking into account the latest licence fee changes it will cost your Division around $800 a year to keep the system of about thirty five VHF/UHF repeaters and beacons on air.

A lot of upgrading work has been done and is still being carried out by repeater groups through the Victorian Technical Advisory Committee. Several thousand dollars have been spent on equipment and site works — the money mostly comes out of members annual subscriptions.

But not all regular repeater users are WIA members — one forthright person on the Melbourne repeater refers to most of these people as "free-loaders" — maybe he's right. However I would like to believe they've simply failed to pay their renewal or are waiting to be asked to join.

The message members can give those who are not supporting the Institute is simple:

". . . it only costs about seventy cents a week to be a WIA member, why not join and help pay for the repeaters and other essential activities being carried out on behalf of all radio amateurs by Australia's national radio society."

Many thanks to those who have already played a part in recruiting new members.

REFERENCE LIBRARY

For the benefit of WIA members an extensive reference library is maintained at the Wireless Institute Centre.

Magazines including Amateur Radio, QST, Break-In, Radio-Communications, Ham Radio, 73 and others are available for reading or copying.

If you're looking for a circuit diagram, technical article, or other information — you'll probably find it in the WIA library.

With so many callsigns being re-issued there's been a trend of the new holders curious about the history of their call — this can be checked by using old callbooks in the library.

Photocopying facilities are available for members who want to take copies of magazine articles, and this service is also available to members at cost through the post.

WRITING FOR AR MAGAZINE

The Victorian Division actively encourages its members to contribute articles and/or photographs for publication in the Institute's journal.

Each year those contributions judged to be the best three are given cash prizes under the Kinnear Trophy scheme.

To make it even easy for a member to get started on the article of their choice a guide has been prepared.

Anyone thinking about contributing to AR Magazine and feel they could benefit from some guidelines — write to the AR Liaison Officer, 412 Brunswick Street, Fitzroy Vic. 3065.

VICTORIA 150

VICTORIA 150

Celebrations for the 150th anniversary of European settlement in Victoria have begun, and your Division has taken on possibly the most ambitious exercise of its type seen in Australia

Using the commemorative callsign VI3WI on a roster system members through the WIA zones and clubs will tell the world about Victoria 150 in a true spirit of community involvement.

All VK3 radio amateurs have their part to play in publicising the Victoria 150 Award available to VKs and DX stations.

Award rules are simple, VK3 stations need to contact 150 others in VK3, all other VKs require 15 VK3s and DX stations have only to contact one VK3

Printing of the award certificate is being done with help from the Victoria 150 Committee. The certificate and a special commemorative QSL for VI3WI will be shown in AR Magazine later.

Another Victoria 150 event which the WIA through WICEN will be participating is the Caltex Great Victorian Bike Ride, over nine days from Wodonga to Melbourne starting on 1st December

Organisers approached the WIA to provide communications for the event after the army pulled out from doing the job.

WICEN co-ordinator Derek McNiel VK3BYA recognised the WICEN exercise value and public relations possibilities arising out of amateur radio's participation.

He had no hesitation in confirming with organisers WICEN's involvement.

Derek sees the event not just as an exercise in message handling, but one involving administration and co-ordination skills.

Several WICEN regions will have control of individual sections of the Bike Ride and then handing over the job without loss of continuity to the next region.

CLAIMING THE 150 AWARD

Each award claim should include $2 or equivalent and the claimants QSL card completed for a contact with VK3 and have on it congratulations for Victoria's 150th anniversary.

Claims to: Victoria 150 Award, Wireless Institute, 412 Brunswick Street, Fitzroy, Victoria, 3065.

Photograph by Ken McLachlan VK3AH

Karen Linton the XYL of WIA Victorian President Jim VK3PC, and harmonic (broken arm in plaster) Tony aged six, are shown how the VK3WI station equipment works. The Icom IC-745, automatic antenna tuner IC-AT100, power supply IC-PS30, and IC-SM6 desk microphone are being used under the Victoria 150 commemorative callsign VI3WI.

Photograph by Ken McLachlan VK3AH

Icom International President, Tokuzo Inoue JA3FA hands WIA Victorian President Jim Linton VK3PC an IC-745 all band HF transceiver. Tokuzo who became the WIA's first JA member earlier this year kindly donated a complete HF station for the Institute's Club Station VK3WI.

NATIONAL PARKS AWARD

If you're looking for activity from Victoria's National Parks several will be activated this month.

Both the Eastern and East Gippsland Zones are making a special effort with their members setting up in parks on the weekend of 24th and 25th November.

This should certainly be a help to those chasing the Keith Roget Memorial National Parks Award — further details are to be on the Sunday broadcast.

Congratulations to the Geelong ARC, Mildura Club and the EMDRC for already putting parks on air this year.

KIDS SHOW PROMOTES HOBBY

Television exposure for amateurs was achieved last month when young novice, Jamie Baker VK3NWA appeared on the Ossie Ostrich Video Show.

The National 9 Network programme had an interview with Jamie and showed him on air.

Considerable interest was generated by the segment and viewers were told for further information they should contact the Wireless Institute.

AR

VK2 MINI BULLETIN

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
PO Box 1066, Parramatta, NSW 2150

The first Sunday this month will be the 11th Conference of Clubs being held at Bathurst and hosted by the Orange Amateur Radio Club. It is almost the end of the Institute's financial year so may I remind those members who joined at some stage this year that because we are still on annual billing, the new computer will not start with a cyclic billing until perhaps next year, you will receive an account to make up the difference in subscription until the end of 1985. All accounts for 1985 are expected to be posted towards the end of this month.

INTERFERENCE

Mention has previously been made in this column of the interference being experienced to Sydney VHF operation in particular channel 7000. Work is and always has been going on to identify the problem sources. It does not help those out looking to have someone jam and time out the system because they don't like what is going on. That action is as bad as the problem source. At times there are so many funny signals on the air, often talking to those who claim that they are "wombats" that it is hard to determine who is the worst. Do not acknowledge, engage or confront those causing the problem. The authorities may include you in the round up. By not acknowledging the presence of these intruders they often get discouraged and go away. Being spoken to or about just keeps them there longer.

CURRENT CALL BOOK

The 1984/85 Call Book is still available from the Divisional Office at the reduced price of $5.00 collect or $6.60 posted to members. It is well worth it for the reference material alone. With holidays coming up for many, an up-to-date list of repeaters interstate is a must. Stocks are limited and there is no further supplies until the next edition in late '85.

CHANNEL 0

It was not good news to see that both Sydney and Melbourne are to have a further year of Ch 0 signals. It puts the case for greater access to all of 6 metres one step back. The Institute will keep reminding the authorities of their promises and the amateurs should do likewise.

ANNIVERSARY

The records indicate that the Institute was formed during March 1910 and this month in 1985 will be a big event in VK2. In the planning stages are a dinner, another seminar and the Annual General Meeting (Saturday the 30th. Formal notice later.)

HELPERS NEEDED!!

May I remind you that for current news — since these notes have a long lead time — the Division conducts two broadcasts each Sunday, the first at 11 AM and the evening session at 7.30 PM (local time). Hear it first and hear it first hand. Would you like to help present it? Further engineers and announcers are required for the first quarter of 1985.

DIVISIONAL LIBRARY

Aub Topp, Divisional Librarian would like to say thanks for the many donations to the Library. *"As Librarian it is gratifying to see the amateur spirit of helping fellow amateurs still prevails. Over the past year there have been many requests for technical articles. In most cases the requested data was supplied from the library. However, some items were not available and a call for assistance over the Sunday Broadcast brought swift results, in most cases the technical data was on its way within fourteen days.*

"Thanks to the following by callsigns for their donations and those who responded to assistance requests. VK2's RV, HV, XRC, II, FD, EMC, AXN, PS, AXR, ZAB, DQL, AVY, DYP, AIM, VJ. I hope that I have not missed any calls. To all members who donated, many thanks for your contributions which will make the VK2 Library a real source of data for our members. A word in closing, if you find that you no longer require various books and electronic magazines, please contact me before consigning them to the tip. There may be some issues which will fill a gap or make up spare sets. A note to me via PO Box 1066, Parramatta NSW 2150 or a phone call during office hours, 11 AM to 2 PM on (02) 689 2417 will get a message to me."

AR

FORWARD BIAS

VK1 DIVISION

John MacPhee
FORWARD BIAS EDITOR
36 Kavel Street, Torrens, ACT 2607

This month I have the pleasure of congratulating one of our novice students who has successfully passed the NAOCP Exams. He is Adrian Amato, who now sports the callsign VK1NYA. Congratulations and I hope that I can put more names in this column after this months exams.

November has always been the month in which we have our end of year party and this year won't be any different. The date for the end of year celebrations, is the 26th November and will be held at the usual meeting room, the Griffen Centre, Civic. Come along and have a chat to some of your mates and maybe a glass of fermented grape juice.

Over this past year, I have had a number of people send articles to me for printing in this column. One of these people is John McKendrick. John has been writing about CW and this month he has a very interesting article for us and he is also offering to take your cards for LU(Z). John's address is Box 63, Hawker, ACT 2614, so send your cards to him by the 15th November. My thanks also go to the other contributors to the column, it is very much appreciated Now for John's CW notes

Well the past two months have really been dismal on 20, 15 and 10 metres, particularly after sunset. Even the 14.220 net on Saturday and Sunday fades to nil about 0800 UTC. But the 40 metre openings to the East and West Coast, USA are becoming nightly events — the best times seem to be about 1200 UTC between 7.170 and 7.190 — even the commercials taking a beating from the 40 metre beams, popular in the States and becoming more popular in G, VK and ZL. Summer is coming to the Southern Hemisphere so we will keep our fingers crossed for improved conditions on 15 and 10 despite the sunspot cycle.

We also look forward to our summer visitors —there are super picnic spots and fresh air havens in the ACT — Lake Burley Griffen for water sports, Molongolo River for water skiing, the mountains for fishing and cool climes, and the south coast for sun and surf! Remember visitors please book ahead —call in on 2 metres (146?); VK1 amateurs are awaiting to extend the hand of friendship.

The writer recently spent an enjoyable two weeks in the Philippines. A get together of DU amateurs in Legaspi City (300 miles south of Manila) centre of the BICOL region was hosted by DU5AT and wife Susan. DU5AN, also assisting in the wonderful hospitality were Ino DUIROA/5 and XYL Edna, DU5EBR, Aldo DU5AA, Eddie Chua DU5AZ, Huan Ling and a great group in the region.

Legaspi is a delightful city in the shadow of the active volcano, Mt Mayon, and is easily reached by air, or a 12 hour trip in an airconditioned coach. The region has good tourist facilities and much to see and do. The total amateur population of the Philippines is about 1000 and most of the activity is on two metres —this proved extremely useful during the recent typhoon "Ike" when wide areas of the southern region were damaged and cut off from Manila by regular commercial channels. As I write Mount Mayon is rumbling — shooting ash hundreds of feet in the air and forcing some of the villagers living near to seek sanctuary in more distant parts!

A holiday in the Philippines is highly recommended — particularly to the rural areas and the southern islands — a visitor finds that the Tagalog greeting "MABUHAY" means hospitality, sincerity, and come back again.

Later in the year I will be visiting North and South America; I am willing to take the LU(Z) cards to Ron LU2AH in BA — I understand some of these went astray in the mail — but the cards must reach me, at Box 63, by 15th November. I can guarantee delivery — not reply or confirmation!!

AR

VK4 WIA NOTES

Bud Pounsett, VK4QY
Box 638, GPO, Brisbane, Qld 4001

AMATEUR ADVISORY COMMITTEES

The Federal Convention gave to VK4 the task of re-vitalising the AACs by producing a set of guidelines for submission via FE to DOC. Guy Minter VK4ZXZ, VK4 Federal Councillor, has now produced a draft which has been circulated to Federal Councillors in other states. It is our fervent hope, here in Queensland, that other states see the real need for the Amateur Advisory Committees and give their support and/or constructive criticism to this vital issue.

ANOTHER 2 METRE REPEATER IN THE FAR NORTH

Cairns Amateur Radio Club have recently installed a new replacement repeater atop Queensland's highest mountain. This means that the old one is now looking for a new site. It has been reconditioned and the club is investigating a location to give better coverage to the west of Cairns. More details as to site, frequency etc when they come to hand. Ritchie VK4RR and the Club repeater team are responsible for the good work.

CLUB MEETS CLUB

No, it is not a caveman style jousting match. Far from it, indeed, when members of one Queensland club goes half way to meet members of another club. Meeting half way in Queensland still means lots of kilometres to cover. So far this year, Townsville Club has met with Cairns Club at Mission Beach, Townsville and Mackay got together at Bowen. Now Mackay and Rockhampton (Central Queensland Branch of the Division) are planning a picnic at Claireview. Claireview is one of only two places between Brisbane and Cairns where train travellers get a glimpse of the Pacific Ocean. The other is Cardwell. Each outing has been a picnic which means that all the family gets to go. Surely a wonderful way to make amateur radio a family affair.

GOLD COAST HAMFEST

This very popular gathering of amateurs will take place again this month for the seventh year. In past years, visitors from well north and west of Brisbane have helped to swell the crowd along with a sprinkling of interstate callsigns.

The venue is an excellent one, a large hall with a bar and refreshment facilities and plenty of parking. It will be held at the Albert Waterways Community Centre, opposite Pacific Fair (a large shopping complex) at Broadbeach. The date is the 10th of November, 10 AM to 5 PM.

There will be plenty of interesting displays and activities for amateurs and the organisers have not forgotten the rest of the family. There will be plenty of time, too, for that old traditional amateur activity of earbashing when old friends meet, some for the first time, face-to-face.

NEW SITE, OLD REPEATER, NEW CALLSIGN

The Sunshine Coast Radio Club have relocated their channel 6850, 2 metre repeater on Bald Knob, near Maleny, in the mountains west of Caloundra. The callsign has also been changed from VK4RNC to VK4RSC.

The site was well chosen, as it gives a commanding view of the Sunshine Coast, the Glasshouse Mountains and well to the south of Brisbane. The club's 70 cm repeater is also scheduled to be installed beside the 2 metre equipment and may well be in situ as you read these notes.

Changing callsigns seems to be the thing to do on the Sunshine Coast, the medium wave broadcast station at Nambour now has the callsign, 4SS and can still be found on 828 kHz.

AR

FIVE-EIGHTH WAVE

Jennifer Warrington, VK5ANW
59 Albert Street, Clarence Gardens, SA 5039

Last month I wrote about our involvement with the Jubilee 150 project and as you will have heard by now things have gone very well and we have to date been granted half the funding we asked for from the Department of Tourism, and a promise of help to find sponsors for the other half, so it looks as though things are off to a good start for Jubilee 150.

WIA ANNIVERSARY

However, it has also been brought to my attention that before we get to 1986 we have 1985, and there shouldn't be any but the very newest WIA members who don't know what that means (and even they would be hard pressed not to notice other references in this magazine to our 75th Anniversary!). Let's be serious for a moment. Have you thought what you or your club will be doing to celebrate our Birthday, or have you thought of anything that you would like to see this division doing. To date our only suggestion (which was made by Dave Hogben, the PR officer at the GPO) has been that we once again set up a display in the GPO to coincide with the launch of the WIA's pre-stamped envelope. The date has yet to be verified. Naturally, many of our activities will tie-in with things which have been co-ordinated Federally, but we would still like to hear your thoughts and suggestions.

THANK YOU

After a request in our local Journal for a trapped vertical suitable for use at display stations etc, I was delighted to receive a phone call from Ken Townsend VK5PHT (President of the API Club) offering to donate such an aerial to the Division, so thank-you Ken on behalf of the Council and members.

MILDURA GATHERING

The ALARA Get-together in Mildura saw SA represented by five YLs and four OMs, and a marvellous weekend was had by all. Carol VK5PWA was very disappointed not to be able to attend as she had a work commitment in Sydney that weekend. However, she had a half hour stop-over in Adelaide between the time her plane from Port Lincoln got in, and the next one left for Sydney, so Marlene VK5QO, Joy VK5YJ, Joy's daughter Michelle and grand-daughter Rebecca; and my daughter Wendy and I, all turned up to meet her. It nearly didn't happen but fortunately she spotted me waving a hand-held around. She was expecting to see Marlene but not everyone else as she had asked Marlene to collect from her a parcel containing one lace edged handkerchief with "ALARA 84" printed on it, for each of the YLs at Mildura; a really lovely gesture which was much appreciated.

VK7 VISITORS

On the previous Monday I played host to Helene VK7HD and OM Peter VK7PR. Helene is the president of ALARA and although I am her Secretary we had never met before. On the Tuesday night Marlene VK5QO and Brian VK5CA, invited a group of VK5 YLs to their place to meet Helene and Peter.

DIARY DATES — 2nd-4th November, Morphettville.
27th November, speaker from DOC.

AR

QSP

COMPUTERISED DICTIONARY

The Oxford English Dictionary, that ultimate work of reference for scholars and etymologists, is about to enter the computer age.

With the help of the British Government, its publishers, The Oxford University Press, are to transfer all twelve volumes onto computer and integrate into the main body of the dictionary all the words contained in the four supplements which have been issued to update the original entries.

The OUP, currently celebrating its centenary year, has announced a $10.8 million deal to undertake the computerisation programme — involving researchers in the UK, Canada and the United States.

The first task will be to transcribe the 21,000 pages of words and definitions contained with the total of sixteen volumes onto an enormous database and so produce the very first multi-volume integrated Oxford English Dictionary.

This alone will take 120 people up to 18 months — a lengthy process, but nothing compared to the 50 years it took to produce the dictionary initially and the 38 years over which the supplements have been added.

Then this first complete edition of the $930 dictionary will be made available on magnetic tape, optical disk or on-line.

The University of Waterloo in Ontario Canada, is to help with research into computer science and together with OUP will conduct a survey of potential users of an electronic OED database.

The result will be a dictionary which covers the English language from the middle of the 12th century until the present day, and which can accept hundreds of new words, or alter definitions of old words, entering the language each year.

The publication of electronic versions of the OED will also allow additional material to be added. Parallel works such as the recently-published Newfoundland English Dictionary or the Australian English Dictionary now in preparation, could be incorporated.

The specialist information needed for teaching English as a foreign language could also be added to relevant entries. Illustrations might be made available and archival material stored for electronic users.

Computerisation of the OED is the largest research project the Oxford University Press has undertaken since it first agreed to publish the dictionary over 100 years ago. The whole project is expected to take four years.

Conscious of its responsibility to maintain the highest standards of scholarship, the firm has appointed an advisory council of academics to supervise the project and an editorial board of scholars, lexicographers and computer experts from throughout the English-speaking world will soon be appointed to oversee the project.

from Information Technology from Britain — August 1984

AR

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

IN REPLY TO AN AUGUST LETTER

Correspondent Ian R Bryce VK3BRY (August AR) has missed the point of my article 'Horizontal versus Vertical Polarisation at VHF and UHF' (May AR).

The article was presented as a summary of the pros and cons of horizontal and vertical polarisation rather than a rigorous analysis of the subject. References were provided for anyone who wished to obtain more information. My reference to F C Judd G2BCX was entirely compatible with the style of the article.

My observation that researchers are conservative was not an insult, quite the contrary. However VK3BRY's reference to 'irrelevant' Indian experiments seems a bit suspect in this regard.

I cannot comment on VK3BRY's assertion that lack of symmetry is the only cause of depolarisation because I don't know what he means by that.

Considering the path loss question: It is axiomatic that power radiated from the transmitter which does not appear at the receiver input, is lost. Therefore power radiated in a vertically polarised wave which is intended for the receiver connected to a vertically polarised receiving antenna and which appears instead at the terminals of the horizontally polarized antenna, albeit at the same receiving site, is lost.

The cross polarisation discrimination factor (XPD) reveals this loss because XPD is defined as the ratio of the amplitude of the orthogonally polarised component of radio waves, produced by some propagation mechanism, to the amplitude of the original plane polorised wave.

For example consider the following common circumstances:

(a) The signal power at the input of a receiver connected to a horizontally polarised antenna receiving a horizontally polarised transmission is 100 times the signal power available at the terminals of a vertically polarized receiving antenna at the same site due to the same transmission. XPD is -20 dB.

(b) The signal power available at the terminals of a horizontally polarised antenna receiving a vertically polarised transmission is twice that at the input of a receiver connected to the vertically polarised antenna at the same site. XPD is +3 dB.

Now suppose that the total signal power available at the receiving site due to either transmission was ten units. In example (a) 9.9 (approx) units would be available to the receiver and in example (b) 3.3 (approx) units would be available to the receiver.

Hence the effective path loss for the vertically polarised transmission would be 10 log 9.9/3.3 = 4.8 dB (approx) more than the path loss for the horizontally polarised transmission and this figure does not account fully for other losses, eg absorption, which are worse for the vertically polarized link.

73

Gordon McDonald VK2ZAB
59 Wideview Road,
Berowra Heights, NSW 2082

AR

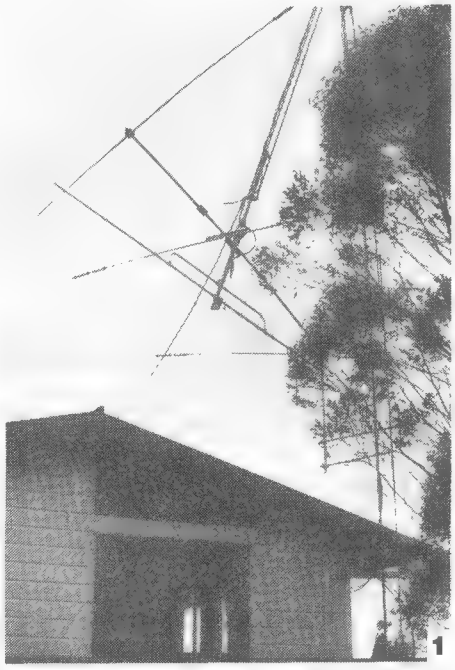
RADIO AND TV HISTORY REVIEWED

If the history of radio and electronic developments interest you, then the special centennial issue of the IEEE Transactions on Consumer Electronics (Vol CE-30, No 2, May 1984, 211 pages) is well worth reading. There are reprints of very early historical recounts of discoveries and applications, as well as the development of the various American clubs and associations. Lots of photographs and illustrations of both the men and the circuits, devices and odd artifacts, provide rare glimpses at some of the names and legends of present day communications. The logic shown behind the development of colour television provides a basic introduction to the present day designs, and cleared up a few why and wherefores that I have had for years (without the mathematics!). In short I spent a lot of my time reading and enjoying most of these articles, and would probably savour it a lot more if I had a paper copy (my copy is on microfiche).

Iain Morrison VK4KIG,
53 Bellevue Terrace,
St Lucia, Qld.

AR

AN ILL WIND!!



1

2

During a very heavy storm up here on Mount Tamborine about four months ago, with the wind reaching — according to the local expert — 90 MPH, my poor old three element yagi said that that was enough and came toppling down from its lofty perch. Fortunately it managed to hang on and didn't crash on the roof of the house, as if it had there would have been considerable damage done. This is clearly shown in Photo No 1. Photo No 2 shows a couple of very helpful amateurs giving me a hand at getting the top section of the mast down to ground level.

3

However they say that it is an ill wind that blows nobody any good, so it wasn't such an ill wind after all, as I managed to get a log periodic antenna up in its place as shown in Photo 3. The results that I am getting from the log are quite outstanding, and looking back it was worth going through the traumatic experience, as quite honestly I couldn't have been justified in replacing my yagi for a log without the aid of that storm.

73 Sincerely,
Ray Robinson, VK4ACU
9 Magnetic Drive,
Eagle Heights, Qld, 4271

AR

DIFFICULTY

On behalf of all those readers who have difficulty in reading "AR" — not merely the sight impaired — I enter two please:

To contributors — cut the waffle and adopt a crisp, modern style.

To editor and production people — bring back the larger type-faces please!

Let's try and get the inside of the magazine to match the excellence of its covers. 73

Harry Atkinson VK6WZ,
294, Middleton Road,
Albany WA 6330

AR

QSP

AMATEURS AT THE OLYMPICS

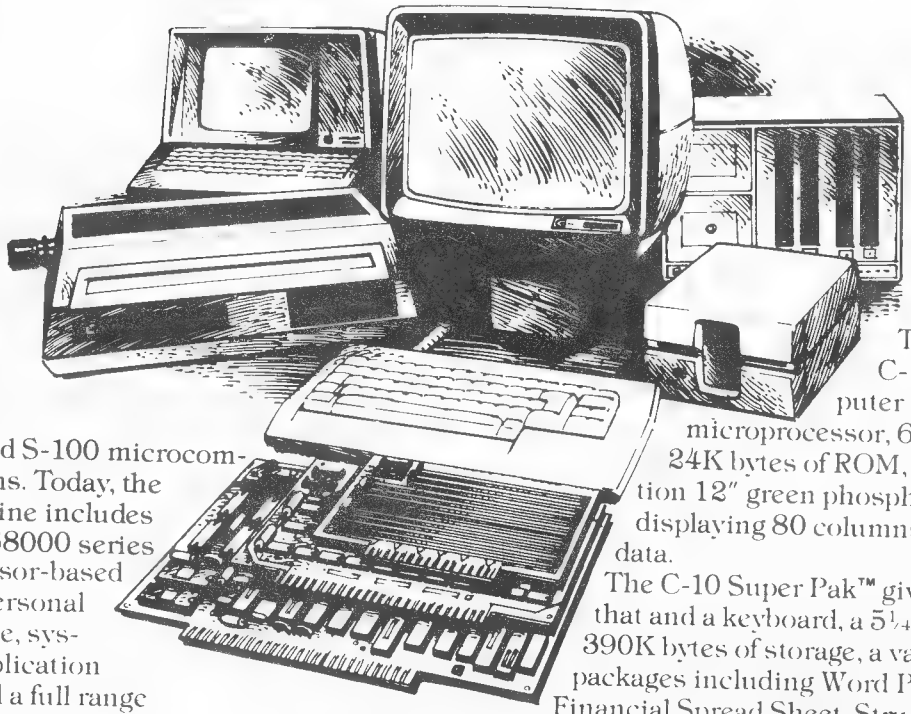
Darrell Price N8FTS won a gold medal for archery at the recent Olympic Games in Los Angeles.

Also, Sheila Conover KB6CZX finished sixth in the Women's 500 metre Kayak Singles.

from ARRL Letter — Vol 3, No 18

AR

Cromemco® has it all from build-ins to hands-on. And Insystems has all of *Cromemco*®



Since 1975, Cromemco has been an industry pioneer in advanced, sophisticated S-100 microcomputer systems. Today, the Cromemco line includes Z-80A and 68000 series microprocessor-based systems, a personal computer line, systems and application software, and a full range of board-level products. And Insystems carries them all.

This wide range of systems, software, and components lets you choose the hardware/software combination best suited for you. Consider their board-level products, for instance.

Cromemco offers a wide variety of board-level system components, including CPUs, memory cards, graphics and I/O cards. These boards are fully integrated with each other and with Cromemco systems to assure reliability. With these S-100 bus cards, systems can be easily configured for specific applications in almost any professional, industrial, or business field.

In addition, Cromemco offers a complete line of support system components, such as card cages, power supplies, extender cards, and system connector cables for individual or OEM system requirements.

A good reason to buy a personal computer.

The Cromemco C-10 personal computer includes a Z-80A microprocessor, 64K bytes of RAM, 24K bytes of ROM, and a high resolution 12″ green phosphor CRT, capable of displaying 80 columns and 25 lines of data.

The C-10 Super Pak™ gives you all that and a keyboard, a 5¼″ disk drive with 390K bytes of storage, a variety of software packages including Word Processing, a Financial Spread Sheet, Structured BASIC, Investment Planning, and the CDOS operating system.

Cost? Surprisingly low. Even Cromemco multi-use systems, which support CROMIX and UNIX, and main frame based, high-level languages, are priced well below competing alternatives.

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At Insystems, we offer much more than a vast product line. We offer the technical expertise to help you configure a tailored system to match your individual needs. Our computer experts, intensively trained in all aspects of computers, peripherals, and board-level products, can aid you in selecting the components or systems that solve your problems in the most efficient manner possible.

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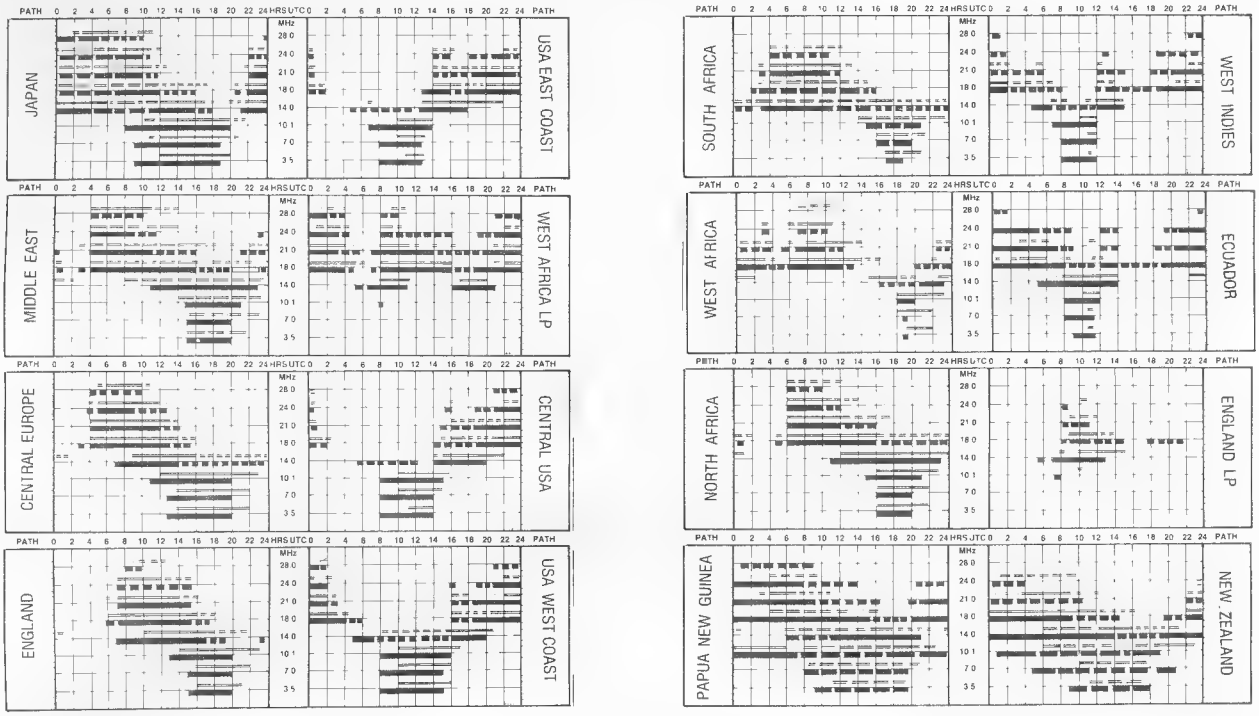
IONOSPHERIC PREDICTIONS

Len Poynter VK3BYE



LEGEND

From Western Australia Perth

From East Australia Canberra

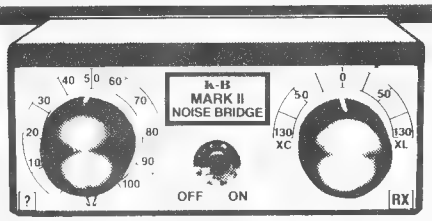
Better than 50% of the month but not every day continuous lines

Less than 50% of the month short broken lines Mixed Mode Dependent on angle of radiation long broken lines

Paths unless otherwise indicated (ie LP – long path) all paths are short path

Predictions reproduced courtesy of the Department of Science and Technology, Ionospheric Prediction Service Sydney

All times in UTC



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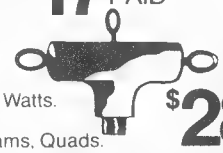

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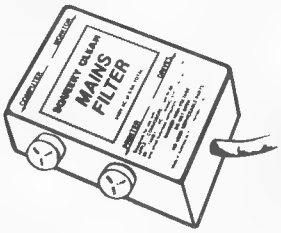

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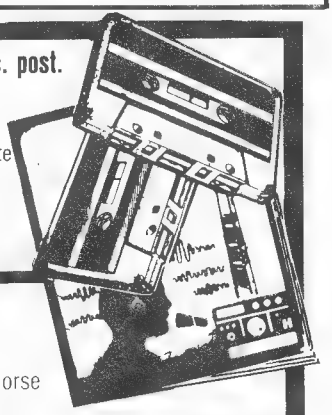

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welcome here

TWENTIETH ANNIVERSARY

The Radio Amateur Society of Thailand celebrates its 20th anniversary this month.

The committee of RAST and its members would like amateurs of Australia to join them in celebrating this auspicious occasion at a party to be held at a ballroom in the Imperial Hotel on 10th November.

RAST is preparing a commemorative publication to mark the anniversary and any message of congratulations from amateurs would enhance the occasion.

Tony Waltham
PUBLIC RELATIONS OFFICER, RAST
AR

Obituaries

BOB FULTON — VK4HF

Bob Fulton VK4HF passed away at home on the Gold Coast on 29th August, 1984. He was 76 years of age.

Bob acquired an interest in radio whilst a Power Station Engineer with the Tasmanian Hydro Electric Commission in the 1930s. Following active service in the Royal Australian Navy 1939-1945 he obtained his licence and callsign VK7AF, operating from Newtown, Hobart. He was an active member of the WIA, Tasmanian Division.

Upon retirement, he moved to Florida Gardens on the Gold Coast in 1970 and obtained the callsign VK4HF. Until his death, he was active on 2 metres as part-time News Reader for the Gold Coast Amateur Radio Society.

Bob is survived by his widow, Lily, daughter Margaret Eiszele (South Australia) and sons Andrew Fulton (Canberra) and Bob Jr (P29NBF) of Goroka, Papua New Guinea.

Robert Fulton P29NBF/VK4VEE
AR

STEVEN ROLLASON — VK3PAR

22-3-63 3-7-84

Fellow amateurs and friends of Steven Rollason VK3PAR will be deeply saddened to hear of the tragic motor accident which took Steve from amongst our ranks on the 3rd July, 1984 at the age of only 21.

Steve's interest in radio and electricity started very early and continued right through his life. Out of countless projects his first project was a homebrew torch which he made when only four years old.

Steve left school to become an apprentice electrician and worked hard to gain his A grade licence. During this time he joined the Eastern and Mountain Districts Radio Club and studied for the NAOCP exams getting his ticket in 1980.

It was again Steve's interest in radio during 1980 that was to change his life, for while pursuing his hobby he first met his fiancee, Carol and their love was to blossom both on and off air.

Steve had a jovial and generous nature and his love for life endeared him to all who knew or met him either in person or over air.

In 1983 Steve joined the WIA but was unable to be as active as he would have liked to have been at times.

Our deepest sympathy goes to Steven's family, Peter, Edna, Anne and Carol.

W McHugh VK3PWR
AR

TED GREGORY — ex VS6EC

Ted passed away suddenly on 26th July 1984. During WWII he served with the RAF and later with the RAAF. After hostilities ceased he was very active as VS6EC in Hong Kong, to give numerous amateur radio friends a new country for DXCC. His most regular QSO, however, was with a YL — Inge DL10V. During the 1950s they both ventured to Perth where they met for the first time. Here they married and settled down. Inge took her AOCP exam and was allocated the callsign VK6OV. The similarity to her DL call is obvious.

Ted delayed in taking his AOCP exam but obtained great pleasure in monitoring the radio spectrum right through from 100 kHz to 30 MHz. He joined the Australian DX Club and supplied them with much interesting information concerning the unusual stations and beacons he had logged. His other hobbies included assisting Inge with her prize Basenji dogs, which were accepted as members of the family — and also the careful cultivation of many Australian plants and trees.

After retiring from work Ted decided he now had the time to study for his AOCP. Earlier this year he passed the regulations and Morse code at 10 WPM, and had enrolled for the August theory exam before he passed away.

Ted's interest in radio communications around the world extended over fifty years.

Inge, on behalf of your many radio friends around the world and especially in VK6 — heartfelt sympathy in your sad loss.

David Couch VK6WT
AR

GORDON VINCENT — VK3AGV

Gordon passed away suddenly at his home on 6th August, 1984, aged almost 79 years.

First licensed in 1948, he retained his interest in amateur radio up to the last. Of latter years, he restricted his activities to an occasional ragchew on eighty metres; but in the early years in his hobby, he had "been there, done that".

From the superior location of his QTH on the hills to the south of Colac, he was amongst the earliest of two metre enthusiasts. In 1961, he was awarded the Wireless Institute certificate for having confirmed contacts with over 100 stations on frequencies above 100 MHz. No big deal, perhaps, till one remembers it was all done with home brew valve equipment and self-designed and constructed antennae.

He had other hobbies, including model steam engines and ancient clocks. He had over fifty of the latter, all in working order, in his shack.

His occupation in his working lifetime as the SEC Line Foreman for the Victorian south-west area, gave him great expertise in the erection of antennae and his skill in this field was always at the disposal of fellow amateurs and friends.

To his wife, Ena, and his two daughters and their families, we extend our sincere sympathy.

D C Stalker VK3KJ
AR

JOHN WILLIAM MORRIS — VK4JQ

Jack passed away on 1st September 1984, and although over the past few months he had been in indifferent health, his death was entirely unexpected. He was sixty two years of age, and had been an active amateur for approximately twenty years. He served with the RAAF in WW2, and due to an accident while on active service was unable to follow outdoor pursuits. He was a lecturer with the WIA before the classes were taken over by the TAFE, and in earlier years was an active participant in the Jamboree on the Air. Jack was a bachelor, and is survived by his mother and three sisters, to whom we extend our deepest sympathy.

Eddie Bange VK4NFC
AR

PETER ADAMS — VK2JX

Peter was admitted to the NSW Radio Transmitters League in January 1928. He was actively involved in the WIA NSW Division as a Committee Member and Secretary. Of latter years he was a member of the Radio Amateur Old Timers Club.

Unfortunately, Peter suffered a stroke in January 1983, became paralysed and was unable to communicate however he was always eager to hear all the amateur news.

Peter passed away on 23rd July, 1984 and will be sadly missed by his many amateur friends.

Deepest sympathy is extended to his wife Dorothea and family.

AR

HUGH SPENCE — VK6FS

Hugh Spence, at the age of sixty four, passed away quietly and without pain after a short illness at the Fremantle Hospital on the 19th September.

He was first licenced in Tasmania in 1938 taking out the call of VK7DS which he held until 1967. On moving to the west the call VK6FS was obtained, which he held until his death.

Hugh joined the Royal Corps of Signals in Launceston on the 4th June, 1940 with the identification number of TX3041 and served five and a half years with the unit that saw service in Darwin, the Middle East, New Guinea, Mortai and Laubauan Island.

This amateur became a proficient CW operator and continued his skill throughout his hobby career, never abandoning his old Morse key. Hugh would never discuss himself or his past experiences but what is known was his ability to get the job done.

His generosity to charity, church and amateur radio, the hobby he loved, was certainly not known until now. Donations of sizeable amounts to various organisations kept his finances at a low level and his pension allowed him the few comforts he sought.

Living alone for the past few years, his contact with the world at large through amateur radio became his centre of interest and activity. Persevering with adverse locations for antennea and operating, he gradually developed an enjoyment of chasing DX.

In his pursuit of DX, he found two other amateurs with similar interests and out of it grew the VK6 DX Chasers Club, with him being one of the founding members. This gentleman's achievement of analysing, correlating and writing the report of the DX operation of VK0CW and VK0HI from the logs, earned him recognition of Honorary Membership to the Japanese DX Family Foundation and the Northern California DX Foundation. He was co-author of the amateur segment contained in the Scientific Report of the 1983 Heard Island Expedition.

Hugh was awaiting, with keen anticipation, confirmation of his 300th DXCC Country. It is hoped that it arrives in the near future to complete his DXCC Album.

Always believing that the pen was mightier than the sword, his letters of compliments or complaint reached many areas from amateur radio, Ministers of the Crown to the local Council and their proposed new Dog By-Laws. His pen expressed his feelings.

Hugh is sleeping now in the last country at the top of the DX ladder.

Neil Penfold VK6NE
AR

ERIC VASS — VK5AEV

It is sad to report the passing of Eric VK5AEV ex G8AD.

Eric was a keen amateur, and a supporter of Amateur Radio Magazine. On page eleven of June magazine a technical article was published and in the July letters, Eric wrote, with difficulty due to failing eyesight, a Reminiscing Letter of his experiences of the part amateur radio played during WWII, a story Eric felt needed to be told.

Deepest sympathy to his family.

AR

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Silent Keys

It is with deep regret we record the passing of —

MR PETER H ADAMS	VK2JX
MR L C DUKE	VK3NLD
MR S B FRIEL	L30283
MR JOHN W MORRIS	VK4JQ
MR HUGH SPENCE	VK6FS
MR ERIC VASS	VK5AEV

NOTICE

ALL copy for inclusion in January 1985 Amateur Radio must arrive at Box 300, Caulfield South, 3162 no later than midday 13th November. It is imperative that contributors adhere to this early deadline for publication, which is necessary due to the Christmas Holiday season.

HAMADS

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write on separate sheets, including ALL details, eg Name, Address, on both. Please write copy for your Hamad as clearly as possible, preferably typed.*

*** Please insert STD code with phone numbers when you advertise.**

- Eight lines free to all WIA members. $9 per 10 words minimum for non-members.
- Copy in typescript please or in block letters double spaced to PO Box 300, Caulfield South 3162.
- Repeats may be charged at full rates.
- QTHR means address is correct as set out in the WIA current Call Book.

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

Conditions for commercial advertising are as follows: The rate is $15 for four lines, plus $2 per line (or part thereof) minimum charge $15 pre-payable. Copy is required by the deadline as stated below indexes on page 1.

TRADE HAMADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and transmitter applications. For data and price list send 105 x 220 SASE TO: RJ & US IMPORTS, Box 157, Mortdale, NSW 2223. (No enquiries at office: 11 Macken Street, Oakley, 2223).

TRADE HAMADS

70 cm power/VSWR meters (see p 23, AR July 1984) 50 W @ $112.80. 23 cm long loop yagis from $64.80. Waveguide modules, tubing & flanges. Gun & mixer diodes at good prices. 0.141" semi-rigid coax @ $2.50/metre. 1/16" DS PTFE board @ 14c/sq cm. 17 pF UHF Porcelain variables @ 10 for $3.50. Send SAE for lists to Microwave Developments, 6 Netley Road, Mount Barker, SA 5251.

WANTED — ACT

MANUALS/CIRCUIT DIAGRAMS or photocopies for FDK Multi 750A, Kemtronix 2000 & Leson TW 232. All costs gratefully paid. VK1GP QTHR. Ph: (062) 88 9835.

WANTED — NSW

CHEAP OLD TCVR OR RX. Any condx considered. Also Kenwood SP520 or SP82 speaker. Peter VK2APJ, QTHR. Ph: (047) 59 1651.

DISK DRIVE for PDP 11/03 computer. 5MB fixed + 5MB removable, top or front loading type. Can be Diablo, Dynex, Wangco, Pertec, Caelus, Hawk & must be 12 sectored. Other types considered. VK2BZE. Please ph: (042) 9 6459.

EXPANSION INTERFACE & dual disk drives for TRS80/1 plus business software. Les Kinch. Ph: (067) 69 6622.

MOBILE TX FOR 2 m FM. Similar IC22S, FT720 etc. EC. Price & condx to Reg VK2ELG, 63 Buffalo Cres, Thurgoona via Albury 2640. Ph: (060) 43 1044.

TEN-TEC MODEL 280 power supply. Ten-Tec Argonaut, model 509 & Ten-Tec electronic keyer, model 670. VK2KSD, QTHR.

WANTED — VIC

CAPACITORS — AT5 final tank or similar for homebrew ATU. 2 required. Barry VK3YBH, QTHR. Ph: (03) 439 8960.

CIRCUIT DIAGRAM for Halicrafters communications rx type AR88LF mod S-38, manufactured around 1944. VK3YBW, QTHR. Ph: (03) 527 2661.

COLLINS R390A MODULES & parts wanted. Particularly IF strip & aerial changeover relay. Also Collins h'book. David VK3BFB. Ph: (03) 587 1593.

HIGH GAIN AVQ-14 antenna base. Will accept complete antenna if necessary. VK3QYR. Ph: (03) 583 5577.

TIME BASE model 6S for BWD525 oscilloscope. VK3AYY. Ph: (03) 725 8770.

TRANSCEIVERS — ex Army AN/PRC 25: Complete or parts. These sets cover 30-76 MHz in 50 kHz steps. This equipment will be used by the 26 Flight Air Training Corps ARC, VK3VPA. Contact Bernard VK3YTT QTHR or Sec, VK3VPA, Box 786, Traralgon 3844 stating price & condx of equipment. Bernard Ph: (051) 73 6560 BH, (051) 34 4275 AH.

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ANY RELIABLE 2 m h'held tcvr to withstand rugged condx, the simpler the better. Mark VK4AQP, QTHR. Ph: (07) 349 5774.

MULTI-MODE BASE STATION 2 m tcvr, digi readout, inbuilt 240 V power supply. Rick VK4AIM. Ph: (079) 51 1413 weekdays only 8 AM -4.30 PM.

VALVE MANUALS — txing & rxing. buy or swap good 10A mains filters ex computers. VK4EF QTHR. Ph: (07) 38 1803.

WANTED — SA

YAGI TRIBAND ANTENNA for 10, 15 & 20 m. Must be in good condx & complete. VK5NWV, QTHR. Ph: (08) 384 3471.

FOR SALE — ACT

KENWOOD 130S tcvr, DFC 230 ext VFO with 4 mem, AT130 ant tun & scann mic 40S. Also ideal for mobile work, cost $1200 — sell $630 the lot. Icom AT100 auto ant tun in mint condx. $330. Ron VK1VS. Ph: (062) 58 6871.

KENWOOD 520S tcvr with Turner mic $350. AT200 tuning unit $120. Glen VK1KAA, QTHR. Ph; (062) 54 8002.

FOR SALE — NSW

ALUMINIUM SPIDER QUAD HUB. Precision cast plus construction details $50+post. Wilson 4el Yagi 10 m, 2" boom $80. Collect or pay freight. VK2BBD QTHR. Ph: (067) 69 6622.

AUDIO SINEWAVE GENERATOR by Advance UK. Valve type in GC. $40. Kenwood AT130 ant tun as new. Still under warranty. $100. Max VK2GE. Ph: (043) 92 4900.

COLLINS 62S-1 VHF t'verter 49.6-54. 2 MHz & 143.6-148.2 MHz, power output 65 W, used in conjunction with 14.0-14.2 MHz rx or tcvr $250 ONO. Kenwood VFO 120. New instr manual $120 ONO. Art VK2AS. Ph: (02) 467 1784.

DECEASED ESTATE-VK2AJC. Yaesu FT-227R memoriser as new $200. Comm rx Trio model JR-599 $200. Trio tx model TX599 $250. CRO Advance Dual Beam as new $400. Colour Pat Gen, Arlunga model no PG 100E, as new $200. All above ONO. Dick Smith Digi Freq cntr-? TR-2200 FM tcvr C/W mic-? IC-22 VHF, FM tcvr-? Inspection invited, no fair offer refused on above & other gear. John VK2ANX, QTHR. Ph: (02) 638 4191.

DECEASED ESTATE — Yaesu FT-7B HF mobile tcvr — no mods $340. VK2AXJ QTHR. Ph: (02) 798 9021 AH, (02) 467 6392 BH.

DISK DRIVES. 2 Pertec flippy drives to suit TRS-80 model 1 or System 80. 1 with case, $150 & $170 or $300 the pair. Packet radio software approach for TRS-80 complete with all manuals & Built-up interface. $80. VK2HL. Ph: (02) 981 4762.

FT-707 with mic — immaculate — little use. Less than 1 year old — owner upgrading. Harry VK2EP, Box 259, Woolgoolga 2456. Ph: (066) 54 1536.

HEATHKIT HW8 QRP CW tcvr — as new. Has 4 bands & built-in adds incl SWR meter, audio amp, S-meter & 21MHz preamp. Full documentation. Cost $250. VK2BTI QTHR. Ph: (02) 871 8394.

ICOM IC-701, PS-701, ICRM-3 controller, all in EC $720. Macrotronics RTTY interface, software (cassette & disk) for Apple, MDK17 modem. All cost over $500, sell for $220. Roger VK2DNX, QTHR. Ph: (02) 546 1927.

ICOM IC-701 HF tcvr with power supply, desk mic. 10-160 m, dual VFO, speech processor. $450. Trio CS-1560 dual beam oscilloscope, DC-15 MHz, with probes. $220. Must sell. Mike VK2BMR, QTHR. Ph: (02) 639 8643.

KENWOOD 120 V MOBILE tcvr with mounting cradle, 100 W Lunar amp. In orig pack & service manual. $490. N Eichhorn, VK2AOH, 1/10 Russell Street, Eastwood, NSW 2122.

KENWOOD TS-120S tcvr with MC-50 mic, mobile mount bracket & mobile mic, SP-120 spkr & manuals. All in orig pack. Mint condx, top performer $530 ONO. Alan VK2KAG. Ph: (02) 451 7038 AH.

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LINEAR 432 MHz, 50 W, UHF Microwave Modules with rx preamp $180 ONO. Realistic AX-190 amateur band rx with match spkr $110 ONO. Peter VK2YPU, QTHR. Ph: (02) 601 1134.

SWAN 100-MX SS mob/base tcvr with match pwr supply $500 ONO. Kenwood TR-2400 h'held c/w/ charger, extn spkr/mic $275. FC-107 ant coupler $120. IC-202 2 m, 7 rptrs, 3 simplex $100. IC-202 2 m SSB $125. All mint condx VK2BTL QTHR, Ph: (02) 487 3383.

TRANSCEIVER FT-200, power supply FP-200, VFO FV-200, YD-844 mic, high Z phones & Morse key $300. Maurice VK2DFJ, QTHR. Ph: (02) 605 9127.

YAESU FT-7 tcvr. Ideal mobile or novice rig. EC $410. Terry. Ph: (066) 44 5528.

YAESU FT-101E CW filter. $350. Yaesu FL-2100B amp $350. Drake MN-2000 Matchbox, 2000 W PEP $300. SSTV monitor & camera OM7M Hamvision $200. Sony B/W Video recorder $50. Heathkit SSB rx, 12 V $40. The lot for $1000. Evert Brand VK2BXV, Bloodwood Park, Tumbledown Dick, NSW 2101.

YAESU FT-207RC 2 m HH, with mic/spkr, 2 cradles, new batt. Sideband SE-502 10 m base/mobile, 12 V/240 V, SWR/RF/S meters, 46 ch. Yaesu FT-301SD HF base/mobile, SSB/AM/CWN filters. Yaesu FP-301D power supply for above, 13 V 25 A, with dig clock, CW IDer. Weston HF-1000 10 m HH, 1 W, with r duck ant. Gareth Davey. Ph: (02) 230 5486, 427 5090.

FOR SALE — VIC

COLLINS R-391 comm rx, 0.5 to 32 MHz, double/triple conversion, 2 RF stages, variable selectivity, dual audio channels, internal calibrator, xtal/VFO ovens, 8 autotune ch, H'book, spares. Orig condx $290. Another 99% complete with fault. $120. Aerial tuner AER-O-COM AAT5, HF, ex aircraft, variometer with dummy load & SWR meter, orig condx $40. David VK3BFB. Ph: (03) 587 1593.

ICOM IC-22S 2 m tcvr complete with manual & access. Perfect condx $200. Iain VK3KHQ. Ph: (03) 82 3537.

NOVICE HF RIG-YAESU FT-7, 30 W PEP, 10 W CW. Built in preamp & attenuator. With hand mic, manual. All in box in EC. $300. Ph: (03) 578 2200.

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SHACK CLEARANCE. Icom IC-25E, 25 W FM $250. Icom IC-280, 10 W remote $200. 2 only Trio PR-651 regulated bench top DC power supplies $200 each. Arlec PS-205 regulated power supply $50. Regency M-400 scan rx $300. JIL 200 + 32 mems Scanmac $350. LDM-815 TR dip meter $75. LIM-870A ant imped meter $75. Omega-T noise bridge $35. AWA E-260 true RMS multimeter with H'book $125. Icom ICM12 VHF marine H'held. 2 only @ $195 each. National VB-900 telephone answering machine $175. Icom ICH12 VHF 150-160 MHz $250. Icom IC4E 70 cm, 2 only $250 each. VK3OT QTHR. Ph: (055) 72 3333.

TONO 7000. W/options. Quick selling price $575. John VK3WZ. Ph: (03) 557 1771 AH, (03) 523 8191 BH.

TONO 9000E RTTY TERMINAL. W/Toshiba TV monitor in EC. $750. Alf VK3LC, QTHR. Ph: (03) 589 5344.

YAESU MUSEN FRG-7 comms rx. Purchased brand new. Little use in EC $250. SEAN VK3SN (VK3CSN). Ph: (03) 317 9933.

YAESU FT-75B complete with AC & DC supplies. $350 ONO. Pwr trans, new from 60-150 mA with chokes. Tx tubes, many types. Bargain prices. VK3UT QTHR. Ph: (055) 69 2320.

YAESU FT-101ZD with narrow CW filter. All WARC bands, mic, service & instruct manuals. EC $725 ONO. VK3BCY QTHR. Ph: (03) 438 3393.

YAESU FT-107M, ext VFO, ant tuner, spker, manuals, desk mic. Good cond, like new. $1100. David VK3VUZ. Ph: (03) 367 6569.

YAESU FT-901D tcvr, fitted with CW/AM filters & 10/24 MHz WARC bands. $740. Helray Mk11 peak power indicator, 200 W model $25. Hi-Mound HK-702 Morse key (marble base) $30. Eric VK3BXA, QTHR. Ph: (057) 65 2384.

FOR SALE — QLD

AERIAL TUNING UNIT, model MFJ-949B in perfect condx. For tech details see page 21, August '84 AR. New price $284. Asking $230. VK4UX QTHR. Ph: (075) 62 1478.

CRYSTALS — 27 MHz marine frequencies. $3 pair. 1 MHz marker xtal $4. Fred VK4RF, QTHR. Ph: (07) 200 7915.

KENWOOD TS-180S, no mods, perf condx. SSB filter fitted, service manual, coil set for new WARC bands. $500 ONO. Siegfried Nickel, Auckland Caravan Park, Gladstone, Qld 4680.

SWAN 240 tcvr complete with H'book. $100 ONO. VK4EK QTHR. Ph: (07) 30 2306 AH.

FOR SALE — WA

TELEPRINTER — SIEMENS M-100 with paper tape reader & reperf $20. Rod VK6AOK, QTHR. Ph: (09) 386 1998.

FOR SALE— TAS

KENWOOD TS-530S, in EC with hand mic $700. Kenwood VFO-240, in EC suit TS-530S $100. Both items with orig pack. VK7RM QTHR. Ph: (002) 23 2808.

MURPHY

Unfortunately the price in the Hy-Tech advertisement, Sept and Oct, should have read $297 not $279 as printed. Apologies to Hy-Tech Distributors.

AR

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BELOW MANUFACTURER'S COST!!

ONLY **$125 COMPLETE**
MASSIVE SAVING OF $74

FULL 90 DAY WARRANTY
★ NEW IMPROVED MODEL ★
As reviewed in Electronics Australia Oct 1982 & Electronics Today International Nov 1982
Cat. XC-2010

At $199 the Voyager Car Computer represented outstanding value for money. The Voyager is the only low-cost unit that will give you full consumption (the most important feature in a car computer) in both metric litres/100km AND good old MPG! At $199 many, many hundreds have been sold. NOW you can grab one absolutely complete for only $125 - a saving of 37% or $74! The Voyager comes complete with all fitting hardware - even down to a roll of insulation tape! Installation generally takes between 4 and 6 hours depending on vehicle.
SPARE FLOW SENSORS To avoid problems when changing cars, why not buy a spare fuel flow sensor? They are about the only thing that can wear out.
Cat. XC-2036 ONLY **$29.50**

The Voyager is available from the following dealers at your convenience.
★ ALL JAYCAR STORES AND BY MAIL ORDER: JAYCAR P.O. Box 480 Auburn 2144 ★ ZAP ELECTRONICS (all stores) ★ ROD IRVING (Melbourne 347 9257 or Northcote 489 8131 ★ ALTRONICS (Perth 328 1599)

ELECTRONIC BELT DRIVE TURNTABLE - BSR QUALITY

Jaycar has made a sensational SCOOP PURCHASE of B.S.R. belt drive turntables from England at below manufacturers cost!
Two models available AA-0290 works from 9-12V DC and the AA-0292 from 240V AC (includes 12V 400mA adaptor). The DC motor drive is electronically controlled.
SPECIFICATIONS: ★ Dimensions 330(W) x 285(D) x 60(H)mm overall ★ Platter diameter 280mm ★ 2 speed - 33 & 45 rpm (internally adjustable) ★ Pick-up arm counterbalanced type with cueing facility ★ Pick-up ceramic (stereo) with diamond stylus ★ Turntable operation - auto stop, will return to rest automatically, turntable chassis is sprung on all corners with transit screws and clips. ★ Weight 1.5kg ★ Output stereo RCA sockets underneath unit.

CHECK THE PRICE! Cat. AA-0290
(requires 9-12V DC @ 400mA)
ONLY $29.95
240V VERSION Cat. AA-0292
(includes 12V 400mA adaptor)
ONLY $39.95
(Post and Packing this item $5 not $4.50)

HIGH RESOLUTION GREEN & AMBER SCREEN MONITORS
NEW MICRON SERIES II

- 1050 lines resolution centre screen
- 22MHz bandwidth
- Video input switch for networking
- Non-glare high grade monitor tube

MICROBOTS® BACK!!

We have secured another shipment of the two most popular Micro Robot kits.

PIPER MOUSE

This 'microbot' is powered by 2 DC motors that drive wheels. When special ultrasonic whistle is blown, the unit goes left, right, straight ahead according to your command.Complete, including perspex dome cover! Be a Pied Piper!
Cat. KJ-6680

$34.95 - SAVE $5.00

MEMOCON CRAWLER

This robot is controlled by a keyboard (which is supplied). The keyboard plugs into the robot. Up to 256 discrete commands can be entered into the robots memory (RAM). The robot will then move according to programmed instructions. Lights and a buzzer can also be programmed to operate as well.
Cat. KJ-6686

$69.95 - SAVE $10.00

JAYCAR VIDEO ENHANCER

A service to the Professional

Designed by a staff member of a well known Australian University and made in Australia. It is the only 625 line 50 frame PAL-D Australian designed and made unit that we know of. The unit features enhance, core/gamma control and by-pass switch. It will drive up to 3 VCR's at once with no degradation and works well as a video distribution amp as well. This is NOT A KIT and is guaranteed for 3 months.
Cat. AV-6501

NOT $69.95 ONLY $59.95

★ NEW ★
"SQUEAKY CLEAN" MAINS FILTERS

Two fantastic low cost models. MS-4010 will supply up to 4 appliances. Each 240V socket is isolated from the other, i.e. interference from disc drives is de-coupled from the CPU power supply etc.
It will supply up to 4 outlets with a total load of 6 amps (unswitched)
Cat. MS-4010

ONLY $99

Single 10 amp line-socket type filter (unswitched).
Cat. MS-4012

ONLY $29.95

400 VOLT TRIAC BARGAIN!!

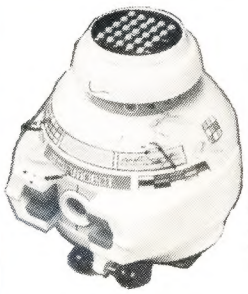
Yet another SCOOP PURCHASE!! Genuine 'Motorola' brand 2N6343 12A 400V Triac. TO-220 case. Equivalent to GE SC141D which sells for $1.65. (As used in the Musicolor).
Cat. ZX-7140

ONLY $1.50 each OR pack of 10 for $10.00

VHF-FM WIRELESS TRANSMITTER MODULE

Compact, very stable ultra-low power transmitter. So stable that 10 of them will sit side-by-side on 1MHz of bandwidth and not interfere with each other. Low current drain from a 9V battery, works in the little used low-end of the FM band. Tuneable. Line level input with trimpot attenuator. Low noise Hi Fi.
One was recently used by a very famous ice skating pair to transmit to them on ice. Complete with specs sheet and connection instructions.
Cat. DT-5450

ONLY $49.95



NEW - PROGRAMMABLE MOBILE ROBOT

Low-cost fun learning with this sophisticated robot! Have hours of educational fun programming this fun device to do what you command through the 25-key keyboard on its head!!
FEATURES: ★ 4 bit microprocessor controlled ★ 3 speed gears selected by programming thru' micro ★ Can travel in 4 directions plus angles and curves ★ Has lights and audio ★ Complex routines can be easily programmed (up to 48 commands long).
Cat. XR-1024

SAVE WITH JAYCAR - ONLY $49.95

BARGAIN OF THE CENTURY!!

How do we do it? Another BARGAIN!!

Once again, Jaycar has secured a massive below-cost scoop purchase. This time a nifty combination VHF/UHF television tuner assembly! We DARE NOT MENTION the FAMOUS JAPANESE BRAND of this quality assembly!

- ★ Brand, spanking new
- ★ Separate VHF rotary tuner
- ★ Separate UHF rotary tuner
- ★ All knobs and wiring INCLUDED!
- ★ Attractive front panel fascia included!
- ★ Circuit diagram included!

Be quick to secure one of these as we only have limited stocks.
Cat. DM-9004

ONLY $69.95 - HURRY!!

SHOWROOMS
SYDNEY - 117 York Street
Tel:(02) 267 1614 Telex: 72293
CARLINGFORD - Cnr. Carlingford & Pennant Hills Road
Tel: (02) 872 4444
CONCORD - 115/117 Parramatta Rd.
Tel: (02) 745 3077
HURSTVILLE - 121 Forest Road.
Tel: (02) 570 7000

Jaycar ELECTRONICS

SHOP HOURS
Mon - Fri: 9am - 5.30 pm Carlingford, Concord and Hurstville
Mon - Fri: 8.30am - 5.30pm Sydney.
Thursday nights: 8.30pm Carlingford, Hurstville and Sydney
Saturday: Concord 9am - 4pm: Sydney 8.30am - 4pm
Saturday: Carlingford & Hurstville 9am - 12pm

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$50 - $99.99	$6.50
$100 - $198	$8.00
Over $199	$10.00

COMET ROAD FREIGHT ANYWHERE IN AUSTRALIA ONLY $12.00

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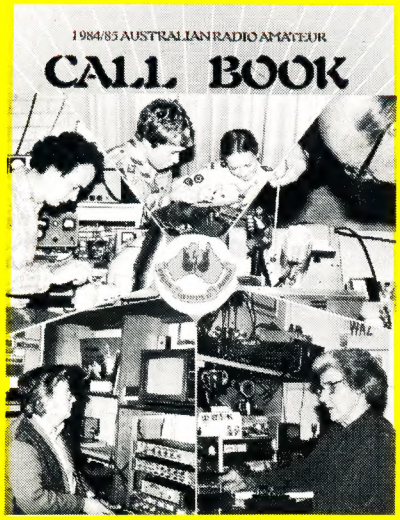
WAREHOUSE MOVING FROM OCT 1st TO 7/9 RAWSON ST. AUBURN 2144

BOOKS PUBLICATIONS MAPS

AUSTRALIAN CALLBOOK



1984/85 CALLBOOK

The current Australian callbook lists in excess of 15,000 call signs. Other useful information includes: History of Amateur Radio, Q codes, World Time Zones, Radio Clubs Directory, WICEN, Band Plans, List of VHF/UHF repeaters (Australia and New Zealand) Beacons, Broadcast and TV Station frequencies plus a lot more. A must for the library of every SWL & Amateur.

$5.95 + $2 p&p

SHORTWAVE FREQUENCY DIRECTORY CAT NO: SFD

A comprehensive 1.6 to 30MHz directory of agencies and frequencies using HF spectrum. Some 5000 listings on over 200 pages includes aircraft, ships, space, Army, Navy, Coast Guard, beacons, RTTY/FAX, clandestine and pirate broadcasters.

$22 + $2 p&p

EUROPEAN VERSION CAT NO: SPDE IS ALSO AVAILABLE.

$17 + $2 p&p

SHORTWAVE
FREQUENCY
DIRECTORY
1.6 - 30 MHz

US & FOREIGN CALLBOOKS

Here they are! The latest editions of the world famous Radio Amateur Callbook are now available. The US edition features over 400,000 listings, with over 75,000 changes from last year. The Foreign edition has over 370,000 listings, over 50,000 changes. Each book lists calls and address information you need to send QSLs. Special features include call changes, census of amateur licences, world-wide QSL bureaus, prefixes of the world, international postal rates, and much more. Place your order for the new 1984 Radio Amateur Callbooks, available now.

US$32, Foreign $30 + $4 p&p

GREAT CIRCLE MAP

This Zenithal Azimuthal Chart or Great Circle Map shows true distance and direction of every point on the earth's surface from Melbourne. For most applications it may also be used from all of the eastern states, South Australia and the Northern Territory. The Great Circle Map is designed as a wall chart 325mm x 430mm.

$1.80 + $2 p&p

WORLD WIDE RADIO TELETYPE FREQUENCY LIST

This comprehensive and up-to-date publication provides a complete list, in frequency order, of HF RTTY stations. Each listing provides the frequency, call signs, station's name and location, as well as operating times. It also lists the mode, ie: BAUDOT, FEC, SITOR, etc.
Listings are also included for RTTY Abbreviations, Scheduled Coast Stations, SITOR/FEC, Frequencies, Press Services in alphabetical order, Press Services in time order as well as Meteorological Stations.

CAT No: WWRS $18 + $2 p&p

RADIO AMATEUR callbook INC.

AMATEURS KIT OF MAPS

Published by Radio Amateur Callbook Inc. the kit consists of maps of North America using a polyconic projection, PREFIX maps of the WORLD using mercator projection 40" x 28" PREFIX ATLAS compiled specially for radio amateurs including 11 maps and great circle chart centred on North America.

$7.50 + $2.50 p&p

RADIO AMATEUR DX GUIDE

Contains a wealth of information for the DX operator and SWL including maps, world QSL Bureaus, Q codes, Z codes and many more.

$3 + $1 p&p

SOUNDS OF SHORTWAVE (60 MINUTE CASSETTE) (CAT NO: SST)

Puzzled by those strange sounds on the shortwave bands? This lively professionally-produced tape identifies them for you! Learn how to recognise jamming, spy transmissions, slow scan TV, teletype, multiplex, facsimile, telemetry and much more from actual off-the-air recorded examples. And as an added feature, helpful answers to your questions about antennas, receivers, grounds and other subjects most often asked by listeners. Get the most out of your listening. Follow the diagnostic tips explained by Grove to test a receiver BEFORE you buy so you won't be disappointed.

$14 + $2 p&p

RADIOTELETYPE PRESS BROADCASTS

A two-part list, the first showing TIME against the agency name, frequencies and language. The second section lists the PRESS AGENCY name against time and frequency.

CAT No: RTPB $20 + $2 p&p

EMBASSY RADIO COMMUNICATIONS WORKBOOK

A frequency register of Diplomatic Shortwave Communications frequencies, this book provides its user with both the SSB, RTTY and CW channels used by a number of countries.

CAT No: ERCW $20 + $2 p&p

GFS electronic imports

AUSTRALIAN DISTRIBUTOR

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